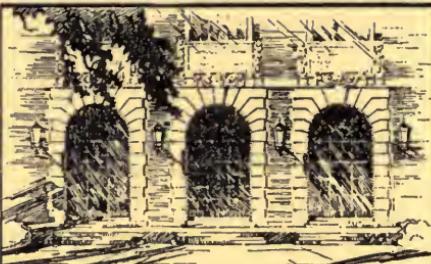


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FLORA OF GUATEMALA

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ROGERS McVAUGH

FIELDIANA: BOTANY
VOLUME 24, PART VII, NUMBER 3
Published by
CHICAGO NATURAL HISTORY MUSEUM
OCTOBER 25, 1963

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PART VII

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ROGERS McVAUGH

*Curator of Vascular Plants, University Herbarium
The University of Michigan*

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Flora of Guatemala

MYRTACEAE. Myrtle Family

Reference: Otto Berg, *Revisio Myrtacearum Americae*, *Linnaea* 27: 1–472. 1855–1856.

Shrubs or trees or rarely subherbaceous. Leaves simple, opposite (except in some introduced genera), exstipulate, entire or rarely crenate, punctate with resinous or pellucid glands, usually pinnately veined. Midvein usually elevated and prominent on the lower surface. Principal lateral veins usually uniting distally into a "marginal vein" which extends nearly the length of the blade and more or less parallel to the margin but somewhat separated from it. Flowers borne on axillary (or rarely terminal) branches, solitary or in specialized bracteate inflorescences with opposite branching, these modified in various ways, e.g., by elongation of the axis and reduction of the lateral axes to one flower each ("racemes"); by suppression of the axis and reduction of the lateral axes to one flower each (flowers in "glomerules" or "umbelliform clusters"); by reduction of lateral axes to one pair, these arising just below the flower which terminates the central axis ("dichasium"); by potentially indefinite elongation of both central and lateral axes, this resulting in a "panicle" with proximal branches elongate and a transition from these to short simple branches and terminal triads of flowers. Flowers regular or essentially so, hermaphrodite or rarely by abortion unisexual. Ovary inferior, the hypanthium adnate to the ovary its whole length or prolonged beyond it so that the stamens, petals and calyx-lobes appear to arise from the distal margin of a short tube surrounding the summit of the ovary. Calyx-lobes usually 4 or 5, distinct and imbricate, or the calyx calyptrate and circumscissile, or rupturing irregularly in anthesis. Petals usually 4 or 5 (sometimes reduced in number or size, or wanting). Stamens usually indefinitely many, in one-many series about the margin of the usually thickened calycine disk, usually inflexed in the bud. Filaments usually filiform and distinct in Guatemalan species. Anthers usually short, versatile or basifixed, bilocular, opening (at least in Guatemalan genera) by longitudinal slits. Style simple, elongate, with small capitate or peltate stigma. Ovary 2- to many-locular, the placentae affixed to the axis or parietal and coalesced into a central axis, the ovules 2 or more. Fruit fleshy or capsular. Embryo various.

The American Myrtaceae, with one exception noted below, are all members of the tribe Myrteae, comprising 40 or more genera. With few exceptions the native genera are exclusively American. The total number of species recognized by Berg a century ago was more than 1600.

In Guatemala there are a few introduced species belonging to the tribe Leptospermeae, subfamily Leptospermoideae, a group that is developed to the greatest extent in the Australian region. The total number of species approaches 1000, including, according to some authors, nearly 500 species of the vast Australian genus *Eucalyptus*. The only native American member of this subfamily is the endemic Chilean species *Tepualia stipularis* (Barn.) Griseb.

One genus not a member of the Guatemalan flora, *Calycolpus*, is represented in eastern Central America (Panama).

KEY TO THE TRIBES

(Guatemalan representatives only)

Fruit dry, capsular, consisting of the capsule immersed in the hardened hypanthium, the valves sometimes projecting beyond the rim of the hypanthium; adult leaves all or nearly all alternate, the juvenile ones often differently formed and more or less opposite.....Tribe I. Leptospermeae.

Fruit fleshy (a few- or many-seeded "berry"); leaves opposite, rarely a few subopposite.....Tribe II. Myrteae.

Tribe I. LEPTOSPERMEAE DC.

Flowers in pedunculate axillary umbels; petals and calyx-lobes united into an operculum which is deciduous at anthesis; large trees with elongate, long-petiolate and often vertically hanging leaves.....*Eucalyptus*.
Flowers closely sessile in spikes at or near the tips of the branches; petals and calyx-lobes distinct, soon deciduous; shrubs or usually small trees with narrow and often short-petiolate leaves.

Leaves 1-2 cm. wide, with several conspicuous longitudinal nerves; stamens creamy white, united in 5 bundles opposite the petals.....*Melaleuca*.

Leaves mostly 1 cm. wide or less, finely pinnately veined; stamens red to pink or pale yellow, not united.....*Callistemon*.

A species of *Callistemon*, tentatively identified as *C. salignus* DC., is planted frequently in parks and in grounds about houses, for ornament, especially around Guatemala. It is a tall shrub or a low tree, the branches usually more or less recurved and with pendent tips; leaves alternate, lance-linear, about 4-5 cm. long, long-attenuate, glabrous or nearly so, with thick margins; flowers spicate, the apex of the spike usually continuing to grow and forming a leafy branch; stamens long and conspicuous, pale yellow or pinkish; fruit a small hard woody capsule.

The cajeput tree, *Melaleuca Leucadendron* L., is planted rather frequently in Guatemalan parks, principally at middle or low elevations. The alternate leaves are narrowly lanceolate, acute or acuminate, pale green, with numerous conspicuous longitudinal nerves. The creamy white flowers are borne in terminal spikes, whose tips after anthesis grow into leafy branches. The fruit is a small woody

capsule. The pale bark is thick and cork-like, and very resistant to fire.

EUCALYPTUS L'Héritier. Eucalipto

Glabrous trees or shrubs, the leaves alternate, leathery, usually elongate, lanceolate and 8–12 cm. long or more, markedly petiolate and often hanging vertically; juvenile foliage (of seedlings or shoots from felled trees) often broad, subsessile and more or less opposite, rarely hairy; flowers usually in pedunculate axillary umbels, sometimes forming panicles; bracts and bracteoles deciduous so early as to be seldom seen; ovary usually 3- to 4-locular, immersed in and surrounded by the fleshy hypanthium which hardens in fruit and is prolonged beyond the the summit of the ovary into a rim which bears the numerous stamens; petals and calyx-lobes united into an operculum which is continuous with the rim of the hypanthium in bud and circumscissile at anthesis; stamens widely spreading in anthesis and forming the showy part of the flower; style about as long as the operculum; ovules and seeds numerous, but only a few in each locule fertile.

A large and almost exclusively Australian genus, at one time supposed to include nearly 500 species; some recent authors have suggested that the actual number is somewhat smaller. A recent account of the Northern Australian species, by S. T. Blake (*Austral. Jour. Bot.* 1: 185–352, t. 1–36. 1953), includes 50 species in this part of the continent; J. M. Black (*Fl. South Austral.* ed. 2, 612–632. 1952) lists 52 species.

Numerous species have been introduced into the tropical and warm-temperate regions of America for ornament, for purposes of reforestation, for wood and for lumber; only the following seems to have been entirely successful.

Eucalyptus globulus* Labill. Voy. 1: 153, t. 13. 1799. *Eucalipto; Ocalipto.

Planted abundantly in Guatemala, from the highlands down almost to sea level; most common, according to Standley (mss.) in Los Altos, at 1500 meters and higher. Native originally of Victoria, New South Wales, and Tasmania, this species is now extensively planted and naturalized from California to Argentina and Chile, especially in semi-arid regions.

A large tree, said to reach a height of 75–90 meters, with pale deciduous bark and yellowish-green angled branchlets; adult leaves alternate, lanceolate and often falcate to narrowly ovate, 2–3 (–6) cm. wide at base, 12–25 cm. long, (3–) 5–8 times as long as wide, attenuate from the base to the slenderly pointed apex, the base often obliquely unequal-sided, abruptly rounded to the flexuous petiole 2–4 cm. long; midvein pale, flat or concave above, convex beneath; leaf-margins

bordered by heavy cartilaginous veins about equal to the midvein but compressed at right angles to the plane of the leaf and often standing somewhat above and below it; lateral veins delicate and inconspicuous, joining an equally slender and nearly straight submarginal vein just within the cartilaginous border; foliage with numerous small dark glands on both surfaces; juvenile shoots and leaves conspicuously whitened and waxy-glaucous, the leaves opposite, sessile, ovate to oblong, cordate, abruptly short-acuminate at tip, 4–5 cm. wide, 7–15 cm. long; flowers large, subsessile, solitary or rarely 3 in an axil, on a massive, broadly 2-angled peduncle up to 5 mm. long, buds 1.7–2.5 cm. long, conspicuously whitened by a heavy waxy-farinose coating; hypanthium about 1 cm. long, truncate at base, strongly 4-angled, obpyramidal, irregularly and coarsely warty-roughened especially on the angles and the thickened margin; calyptra dome-like, roughened like the hypanthium, usually with a broad knoblike or acute central beak; stamens 1.5 cm. long (the flower when expanded 3–4 cm. across), borne on the inner edge of the disk which projects about 3 mm. beyond the thickened margin of the hypanthium; style 8–10 mm. long; fruit 2–2.5 cm. broad and high, flat-topped or the surface convex, the 4–5 valves not exserted but nearly plane with the surface; seeds 1–3 mm. long, very numerous, prismatic, irregularly several-angled.

The following notes are by Mr. Standley: These are trees of rapid growth, sometimes said to attain (in Australia) a height of 45 meters and a trunk diameter of more than a meter when no more than 30 years of age. In North America they grow vigorously but have found little favor because native woods are superior to them. In Central America the trees fortunately are little planted at the present time. It is presumably this species [*E. globulus*] that is most planted in Guatemala, but several others are in cultivation there. To judge from the size of some of the existing trees, the eucalyptus must have been introduced into the Guatemalan highlands many years ago, just why we do not know; perhaps on account of its rapid growth. Now that the trees are grown, no use is made of them except as a source of shade, of which sufficient and more may be obtained more satisfactorily from other trees. The trees have a wide mass of roots, within whose circumference no other plants can grow. Little use is made of the wood; when large trees are felled it is all but impossible to get rid of the trunks. They do not burn readily, and the wood is so hard it is unsatisfactory for fuel. There are some very fine and giant trees about Chimaltenango, Quezaltenango, and other places in the highlands, sometimes in handsome avenues along the roads. When the trees are old the bark peels off in great strips, covering the ground or hanging untidily from the trunks. The leaves, too, often fall in great quantities.

Eucalyptus trees are well known as the source of eucalyptus oil, which has a very distinctive odor and is used in medicine,

especially in treating affections of the respiratory system. Between Guatemala and Amatitlán there is a large grove where oil is extracted from the leaves. Small bunches of the branches and leaves are sold commonly in the Guatemalan markets for use in domestic medicine. The dry leaves are often burned in houses to "disinfect" them.

Because of their peculiar glaucous coloring it is generally possible to recognize eucalyptus trees from a great distance. They appear altogether alien in the Central American landscape. On the dry mountains above Quezaltenango they are the most conspicuous of all trees, towering high above all the rest, and dwarfing even the famous *cipreses romanos* of that region.

Tribe II. MYRTEAE DC.

KEY TO FLOWERING MATERIAL

Inflorescence a compound pedunculate panicle, usually many-flowered, the lower branches of the panicle opposite and themselves compound [panicles reduced to spikes or 3-flowered dichasia in a few species of *Calyptanthes* with calyptrate calyx]; bracts and bracteoles usually deciduous at or before anthesis.

Buds calyptrate, circumscissile, the calyx entirely closed in the bud or else truncate, the lobes then scarcely discernible, soon deciduous, the tube (hypanthium) after anthesis naked, truncate at the mouth.

Calyx closed in bud, the calyptre consisting of a part of the calyx; petals minute or often wanting, mostly adherent to the inside of the calyptre and falling with it; inflorescences axillary (sometimes falsely terminal), usually at leafy nodes; dibrachiate hairs often present and conspicuous, forming the greater part of the pubescence if any; ovules 2 in each of two locules.....*Calyptanthes*.

Calyx open and truncate in the bud, the calyptre consisting of the united petals; inflorescences terminal or (usually) lateral at leafless nodes on old wood; plants glabrous; ovules numerous.....*Eugenia Cumini*.

Buds not calyptrate, the calyx open in the bud, its lobes evident and persistent in flower and in fruit; petals free, conspicuous, falling individually; dibrachiate hairs none or inconspicuous; inflorescences axillary; ovules 1 or 2 in each of two locules.

Calyx-lobes 4; style prominently capitate, the stigma twice as thick as the style; vigorous branchlets often 4-angled; petioles 1.5-2 (-3) cm. long; herbage strongly fragrant.....*Pimenta*.

Calyx-lobes 5; style not at all or scarcely capitate; branchlets terete or compressed; petioles less than 1 cm. long; herbage not or but slightly fragrant.*Myrcia*.

Inflorescences usually not compound, or if so dichasially forked with a sessile terminal flower in each fork; flowers sometimes solitary and axillary, mostly in racemes with few opposite and decussate pairs of flowers; axis of the raceme often so short that the flowers appear fasciculate or glomerate; bracts and/or bracteoles often persistent; ovules usually more than 2 in each locule; locules usually 2, sometimes several.

Calyx in bud closed or essentially so, without definite lobes, sometimes with an apical porelike aperture, opening by irregular longitudinal fissures, or circumscissile.

Calyx calyptrate, circumscissile, the calyptora often remaining attached at one side.

Petals minute, often adhering to the calyptora and falling with it; hypanthium persisting in a ring on the fruit, usually not splitting longitudinally; ovules 2 in each locule; dibrachiate hairs usually present and conspicuous; flowers 3 or more in a dichasium-like or irregularly spike-like inflorescence.....*Calyptranthes*.

Petals evident, sometimes showy, falling independently; hypanthium usually splitting longitudinally into several irregular lobes; ovules numerous; dibrachiate hairs none; flowers solitary and axillary, or sometimes in 3-flowered dichasia with the central flower sessile.....*Psidium*.

Calyx opening by irregular longitudinal fissures, the 3-5 resulting lobes irregularly shaped, one sometimes larger than the others.....*Psidium*.

Calyx-lobes normally developed even in the bud, the calyx at anthesis sometimes splitting beyond the bases of the lobes.

Calyx-lobes 5; flowers axillary and solitary, or in a 3-flowered dichasium.

Bracteoles foliaceous and persistent even in the fruit, 3-8 mm. long; anthers sagittate, the connective dilated; flowers solitary; shrubs of high mountains, with leaves 3 cm. long or less.....*Ugni*.

Bracteoles deciduous at or about the time of anthesis; anthers not sagittate, the filaments filiform; flowers solitary or occasionally 3 in a dichasium; small shrubs of savannahs at middle and low elevations.....*Psidium*.

Calyx-lobes 4.

Inflorescence a raceme, the flowers in opposite decussate bracteate pairs; axis of the raceme often so much abbreviated that the flowers superficially appear to be glomerate or umbellate; terminal flower of the axis usually wanting.

Hypanthium much prolonged beyond the summit of the ovary, forming a funnelform, campanulate or bowl-shaped "calyx-tube" bearing the stamens about its margin.

Inflorescence terminal, or lateral at leafless nodes on old wood; hypanthium persistent, not circumscissile, attenuate at base to a narrow stipelike pseudostalk above the place of attachment of the deciduous bracteoles; flowers large, the buds 6 mm. long or more, the style 8 mm. long or more; ovules numerous, 6-8 or more in each locule; ["*Syzygium*"].....*Eugenia*.

Inflorescences borne in the axils of foliage leaves; hypanthium circumscissile at base after anthesis, not attenuate, usually partly covered by the conspicuous paired persistent involucre-like bracteoles; ovules 2 (-4) in each locule; flowers usually 4, nearly sessile, small, the buds mostly 2.5-3 mm. long, the style 4-6 mm. long.

Myrciaria.

Hypanthium little or not at all prolonged, not circumscissile, persistent with the calyx-lobes in flower and fruit; inflorescence various, never terminal; ovules usually numerous, rarely fewer than 5 in each locule.

Calyx-lobes partly or almost wholly united in the bud, only their tips free, the cracks between the lobes extending at anthesis farther than the length of the free tips, and reaching the edge of the

- staminal disk or beyond; flowers in small clusters at usually leafless nodes, apparently without definite arrangement on a racemose axis; leaves often subsessile, mostly rounded to subcordate at base, the petioles 5 mm. long or less and very short in proportion to the blade; lowlands near the Atlantic Coast. *Psidium*.
- Calyx-lobes distinct in bud and in anthesis, not at all or scarcely separating in anthesis and in fruit; inflorescence racemose, the axis of the raceme usually evident even if very short, and the flowers in pairs on the axis. *Eugenia*.
- Flowers solitary and axillary, or in simple or compound dichasias, the primary axis of the inflorescence if once-forked with a sessile or nearly sessile flower in the fork.
- Flowers mostly 3 or 7 in a dichasium, the sessile terminal flowers in the forks developing earlier than the ones at the tips; flowers, if occasionally solitary, arising from axes of ordinary leaves; bracts and bracteoles inconspicuous, falling at anthesis or before; calyx-lobes large in proportion to the hypanthium, 2.5–3.5 mm. wide. *Myrcianthes*.
- Flowers solitary or occasionally 3 in a dichasium, if solitary then mostly confined to the 1–2 lowermost nodes of a new leafy branch, and then subtended by small bracts rather than by foliage leaves; flowers if more than 3 in elongated or much abbreviated racemes.
- Calyx-lobes minute, or united except at the tips, the calyx at anthesis opening by irregular longitudinal cracks extending usually to the summit of the ovary. *Psidium*.
- Calyx-lobes distinct in bud and in anthesis, not at all or scarcely separating in anthesis and in fruit. *Eugenia*.

KEY TO FRUITING MATERIAL

- Cotyledons foliaceous, folded and contorted; radicle elongate; testa mostly membranaceous, fragile; calyx-lobes, if present, 5; inflorescence compound, often many-flowered, with branches opposite near base and irregularly ternate or solitary near tips; bracts and bracteoles not present at this time.
- Calyx-lobes normally developed and present on the fruit. *Myrcia*.
- Calyx wanting (the tip of the fruit umbilicate) or represented by a shrunken calyptra attached at one side. *Calyptranthes*.
- Embryo not as above, but undivided and homogeneous, or elongate and curved or coiled, or the cotyledons large and plano-convex; calyx-lobes usually 4 and distinct if the flowers are more than 7; bracteoles often persistent.
- Inflorescence compound, many-flowered, with branches opposite near the base of the panicle, and irregularly ternate or solitary near the tips.
- Calyx-lobes 4, persistent; inflorescences in the axils of the upper leaves; seeds usually 2, small, the embryo elongate, curved into a double spiral. *Pimenta*.
- Calyx-lobes deciduous, the fruit surmounted by the collar-like remains of the hypanthium; seed usually 1, large, the cotyledons plano-convex, unequal; inflorescences sometimes terminal, usually lateral at leafless nodes on old wood. *Eugenia Cumini*.
- Inflorescence a simple raceme or if compound a dichasium, or the flowers solitary or apparently glomerate or fasciculate.

- Inflorescence a raceme, the flowers in opposite decussate bracteate pairs; axis often so short that the flowers appear glomerate or fasciculate; terminal flower usually not developing; calyx-lobes 4; embryo massive, undivided, or the cotyledons imperfectly separated.
- Hypanthium prolonged above the ovary, circumscissile at base after anthesis, leaving a circular scar on the fruit; fruit edible, soft-fleshy and juicy, nearly sessile.....*Myrciaria*.
- Hypanthium not circumscissile, scarcely or not at all prolonged; calyx-lobes mostly persistent on the fruit; fruit scarcely edible, with meager flesh, variously disposed.....*Eugenia*.
- Flowers solitary or in simple or compound dichasia, the primary axis of the inflorescence if once-forked with a sessile or nearly sessile flower in the fork; calyx-lobes 4 or 5, or the calyx irregularly, longitudinally dehiscent.
- Seeds one or two; embryo undivided or the cotyledons large and plano-convex; testa thin; calyx-lobes 4, usually distinct and persistent.
- Embryo undivided; flowers solitary, or racemose in some axils ..*Eugenia*.
- Cotyledons fleshy, large, distinct, plano-convex; flowers 3 or 7 in a dichasium, or a few solitary.....*Myrcianthes*.
- Seeds several or many; embryo arcuate ("C-shaped"), with long radicle, short inconspicuous cotyledons and usually bony testa; calyx-lobes 4 or 5, or the calyx splitting irregularly.
- Bracteoles foliaceous, persistent, 3–8 mm. long; flowers solitary; calyx-lobes 5, persistent, not separating at the base in fruit; shrubs of high mountains, with small coriaceous leaves 3 cm. long or less....*Ugni*.
- Bracteoles usually deciduous at or before anthesis, if occasionally persistent small and scariosus; flowers solitary or in a 3-flowered dichasium, or several together at a leafless node; hypanthium somewhat irregularly split down to the summit of the fruit, the remnants of the calyx 3–5, often persisting, the broken tissue along their margins usually evident.....*Psidium*.

CALYPTRANTHES Swartz

References: Berg, Linnaea 27: 18–33. 1855; and in Mart. Fl. Bras. 14, pt. 1: 38–55. 1857; McVaugh, Fieldiana, Bot. 29: 397–412. 1963.

Calyx completely closed in the bud, circumscissile, the operculum usually attached at one side in anthesis, finally completely dehiscent. Petals none, or 2–3 (–5), small and inconspicuous and often attached to the operculum (calyptra) and falling with it. Paired panicles arising from opposite axils at the lowest node of an abortive axis, or the axis prolonged and leafy and the paired panicles from the lowest node, subtended by small or foliaceous bracts. Pubescence usually at least in part of dibrachiate hairs.

A distinctive American genus of perhaps 50–75 species, ranging from Florida through the West Indies and eastern South America to Uruguay. A few species not treated below occur in Costa Rica and Panama, and a few additional species in Mexico.

Members of this genus may often be recognized, even in the sterile condition, by the characteristically forking branchlets and the consequently somewhat zigzag branches. This habit results from the abortion of the terminal buds, and the concomitant development of axillary branchlets, at the growing tips. Potentially floriferous axillary branchlets often abort in the same manner, at the first node above the axil; subsequent development of the opposite floriferous secondary branches from the same node produces the so-called "paired panicles," which often at first glance seem to arise directly from the axil. A more careful examination usually reveals the fact that these two panicles seem to arise from the tip of a very short axillary branch.

In some species of *Calyptranthes* (e.g. *C. Bartlettii*, *C. Karlingii*) the inflorescences ordinarily develop at the terminal node of an old leafy shoot. If, as often happens, an axillary (floriferous) branchlet arises from only one side of the terminal node, then in its growth it pushes aside the undeveloped terminal vegetative bud and becomes aligned with the older part of the leafy branchlet so as to appear terminal rather than axillary. The lowermost secondary branches of this axillary (but apparently terminal) shoot are floriferous (the "paired panicles"). Interpretation of the morphology of this inflorescence may be even more difficult because the central shoot between the paired panicles (which ordinarily aborts in axillary inflorescences) now often elongates and becomes leafy above the panicles, ultimately simulating a new terminal leafy branch, this bearing at its lowermost node a pair of opposite panicles subtended by bracts (not normal leaves).

Leaf-bases broadly cordate or subcordate, the blades nearly sessile or subclasping, on stout short petioles 3 mm. long or less; blades usually acute or obtuse, sometimes obscurely acuminate, never caudate; young leafy branchlets 2- or 4-angled or -winged except in *C. chiapensis* with leaves 12-23 cm. long.

Young branchlets and inflorescence densely ferruginous-tomentose with contorted and mostly 1- or 2-branched but nearly erect hairs 0.4-0.7 mm. long.

Leaves lanceolate, 2-5 cm. wide, 6-12 cm. long; branchlets bicarinate; British Honduras.....*C. Bartlettii*.

Leaves oblong, 6.5-7.5 cm. wide, 12-23 cm. long; branchlets terete or compressed, not carinate; Chiapas.....*C. chiapensis*.

Young branchlets and inflorescence glabrous or thinly pubescent with appressed flat dibrachiate hairs 0.1-0.2 mm. long; branchlets 2- or 4-angled or -winged.

Branchlets biconvex in cross section, bicarinate, the winglike angles terminating distally in the midlines of the leaf-bases.....*C. Contrerasii*.

Branchlets 4-angled, two of the angles terminating distally in the midlines of the leaf-bases, the other angles winged, terminating distally between the leaf-bases.....*C. Karlingii*.

Leaf-bases acute or cuneate or sometimes abruptly rounded, never cordate; blades usually definitely petiolate, often acuminate, sometimes caudate; branchlets various.

Flowers 9 or fewer in each panicle, the two lateral panicle-branchlets and the terminal one each bearing a single pedicellate flower or a cluster of 2-3 sessile flowers; inflorescence 3-5 cm. long, the very slender peduncle usually much longer than the rest of the panicle; leaves 3-7.5 cm. long, long-acuminate.

Leafy branchlets 4-angled or -winged, glabrous or essentially so; panicles glabrous, 3- or 5-flowered, the peduncle filiform.....*C. Hylobates*.

Leafy branchlets terete, at least when young with abundant long straight appressed dibrachiate hairs; panicles pubescent, about 9-flowered, the peduncle up to about 1 mm. wide.....*C. paixillata*.

Flowers more numerous, usually 20-30 or more in each panicle, if only 9 or fewer the leaves 10-16 cm. long, the buds 7-8 mm. long; panicles usually 5 cm. long or more, twice or more compound, the flowers often sessile or sub-sessile in small clusters near the tips.

Plants glabrous or sparingly pubescent; pubescence, if any, usually consisting of minute flat appressed dibrachiate hairs 0.1-0.3 mm. long, these often nearly confined to the base of the hypanthium, the nodes of the inflorescence, and the undeveloped vegetative buds.

Panicles 15-20 cm. long; peduncles compressed, 10-12 cm. long, 3-4.5 mm. wide; leaves, as far as known, 11-12 cm. wide, up to 35 cm. long; inflorescence and buds thinly reddish-pubescent; Petén-British Honduras boundary.....*C. megistophylla*.

Panicles mostly 10 cm. long or less (infrequently up to 15 cm. long); peduncles 3-5 cm. long, less than 2 mm. wide; leaves mostly 12-15 cm. long or less.

Leaves prevailingly obovate to elliptic, obtuse or rounded at tip, 3.5-6.5 cm. long; small connecting veins evident on the lower surface in dried leaves as a raised reticulum; branchlets not wing-angled; pubescence appressed, rather sparse, grayish- or yellowish-white; British Honduras.....*C. cuneifolia*.

Leaves prevailingly elliptic to lanceolate or ovate, acute or acuminate (if small and obtuse then the branchlets winged, the small veins obscure, the pubescence if any reddish).

Leaves small and obtuse, mostly 2.5-4.5 cm. long, usually narrow, often varying on the same plant from 2-5 (-7) times as long as wide; branchlets persistently and prominently wing-angled; pubescence sparse, evanescent, of rather loosely appressed yellow- or reddish-brown hairs; Honduras to British Honduras.

C. hondurensis.

Leaves usually larger and acute or acuminate, usually 2-3 times as long as wide; branchlets wingless or somewhat obscurely winged.

Flower-buds 3-4.5 mm. long, glabrous; branchlets not winged; whole plant essentially glabrous; calyptra conic, thickened, 4 mm. wide; persistent collar-like base of the calyx 3-4 mm. wide in fruit; leaves 10-14 cm. long, prominently acuminate; Chiapas.

C. perlaevigata.

Flower-buds 2-3 mm. long; plants usually sparingly pubescent; calyptra 1.5-2.5 mm. wide; persistent collar-like base of the calyx 1.5-3 mm. wide in fruit.

- Plants glabrous except for a few hairs on the youngest vegetative parts; leaves elliptic-lanceolate, often 3–4 times as long as wide; petioles 7–10 mm. long; branchlets not winged; El Salvador and British Honduras..... *C. Calderonii*.
- Flower-buds and distal nodes of the panicle sparingly pubescent with appressed reddish or pale hairs; leaves mostly elliptic, 2–3 times as long as wide; petioles 2.5–5 mm. long.
- Leafy branchlets (at least some of them) wing-angled in most plants; inflorescence rather slender, the principal secondary branches of the panicle less than 1 mm. wide; mountains of Chiapas *C. pallens* var. *mexicana*.
- Branchlets not wing-angled; inflorescence stout, the principal secondary branches of the panicle much flattened, their lowest internodes often 6–8 mm. long, 1.5 mm. wide; Veracruz; British Honduras to Yucatán... *C. Millspaughii*.
- Plants rather generally pubescent on the young growth and the inflorescence, often softly and loosely so (at least some of the hairs then branched and spreading or erect); hairs often up to 0.5 mm. long, at least to some extent persistent on the branchlets, the inflorescence and the fruits.
- Leaves prevailingly obovate to elliptic, obtuse or rounded at tip, 3.5–6.5 cm. long; branchlets not winged; small connecting veins evident on the lower surface in dried leaves as a raised reticulum; pubescence appressed, rather sparse, grayish- or yellowish-white; British Honduras..... *C. cuneifolia*.
- Leaves prevailingly elliptic to lanceolate or ovate, acute or acuminate (if small and obtuse the branchlets winged, the small veins obscure, the pubescence reddish).
- Leaves small and obtuse, mostly 2.5–4.5 cm. long, usually narrow, often varying on the same plant from 2–5 (–7) times as long as wide; branchlets persistently and prominently wing-angled; pubescence sparse, evanescent, of rather loosely appressed yellow- or reddish-brown hairs; Honduras to British Honduras..... *C. hondurensis*.
- Leaves usually larger and acute or acuminate, if narrow usually consistently so; branchlets usually wingless; pubescence usually copious.
- Young leafy branchlets softly brown- to rufous-tomentose with hairs of two types: Straight and nearly erect, simple or short-branched hairs up to 2 mm. long, these standing above the tomentum of contorted and somewhat appressed hairs with two equal or strongly unequal branches; hairs of the panicles of the contorted, appressed type; buds 3 mm. long or less, obovoid, mostly short-apiculate; branchlets not winged.
- Leaves narrowly elliptic-lanceolate, 1–2.3 cm. wide, 4–6 times as long as wide..... *C. Lindeniana*.
- Leaves elliptic-ovate, 4–6 cm. wide, 2–3 times as long as wide.
- C. Chytraculia* var. *americana*.
- Pubescence of leafy branchlets not as above, not noticeably different from that of the panicle branches, or if so more appressed.
- Hairs coarse, brown to yellowish brown, 0.3–1.5 mm. long, more or less erect and the branchlets tomentose; buds as far as known 4.5 mm. long or more; branchlets not wing-angled.
- Leaves broadly rounded at base; lateral veins impressed above; petioles 8–11 mm. long; buds ovoid, short-apiculate, 4.5–

6 mm. long; tomentum dense, the very numerous erect hairs simple or forked, up to 1.3–1.5 mm. long.....*C. macrantha*.

Leaves acute at base; lateral veins not impressed above; petioles 5–7 mm. long; buds unknown, the calyptra shallow, short-apiculate; tomentum bristly, the very coarse hollow erect forked hairs up to 0.3–0.7 mm. long.....*C. zanquinensis*.

Hairs minute, dibrachiate, often appressed, sometimes crisped, mostly 0.1–0.3 mm. long, the pubescence of the young branchlets and inflorescence rusty brown, yellowish brown or, especially on the leaves, nearly colorless; buds 3 mm. long or less.

Branchlets wing-angled; leaves cuneate at base, often 4–7 cm. long, usually glandular-punctate above; inflorescence copiously soft-pubescent with reddish or sometimes pale hairs; West Indies; southern Florida; Isthmus of Tehuantepec; Yucatán.

C. pallens var. *pallens*.

Branchlets terete or compressed, not wing-angled or occasionally so; leaves acute at base, varying to somewhat rounded or occasionally to cuneate; branches of the inflorescence usually sparingly pubescent except about the distal nodes and the hypanthium; Mexico and Central America.

Inflorescence stout, the principal secondary branches of the panicle much flattened, their lowest internodes often 6–8 mm. long, 1.5 mm. wide; pubescence of very small flat closely appressed longitudinally oriented hairs; British Honduras to Yucatán.....*C. Millsbaughii*.

Inflorescence more slender, the internodes of the secondary panicle-branches terete or slightly compressed, 1 mm. wide or less; pubescence at least in part of crisped or soft hairs; mountains of Mexico and Guatemala.

Leaf-blades often 7–12 cm. long, eglandular above; petioles 8–10 mm. long; branchlets not wing-angled; panicles often 50–60-flowered.....*C. pendula*.

Leaf-blades often 3–7 cm. long, often glandular-punctate above but sometimes inconspicuously so; petioles 2.5–5 mm. long; branchlets (at least some of them) wing-angled in most plants; panicles 30–35-flowered.

C. pallens var. *mexicana*.

Calyptranthes Bartlettii Standl. Field Mus. Bot. 11: 136. 1932.

River banks, rocky ledges along streams, wet forest; known only from El Cayo District, British Honduras (the type from Mountain Pine Ridge, H. H. Bartlett 11837).

A shrub or small tree up to 3.5 meters high; branchlets glabrate, bicarinate, the keels terminating distally in the median lines of the leaf-bases; branchlets when young, and the inflorescence, densely ferruginous-tomentose with more or less erect, flaccid, often contorted and 1- or 2-branched hairs 0.4–0.7 mm. long; leaves coriaceous, glabrate, lanceolate, nearly sessile, (1–) 2–5 cm. wide, 6–12 (–18) cm. long, 3–6 times as long as wide, acute at tip, cordate at base, the margins abruptly decurrent on the inner angles of the very stout petiole 1–2 mm. long and up to 2.5 mm. thick; midvein concave or sulcate above; lateral veins

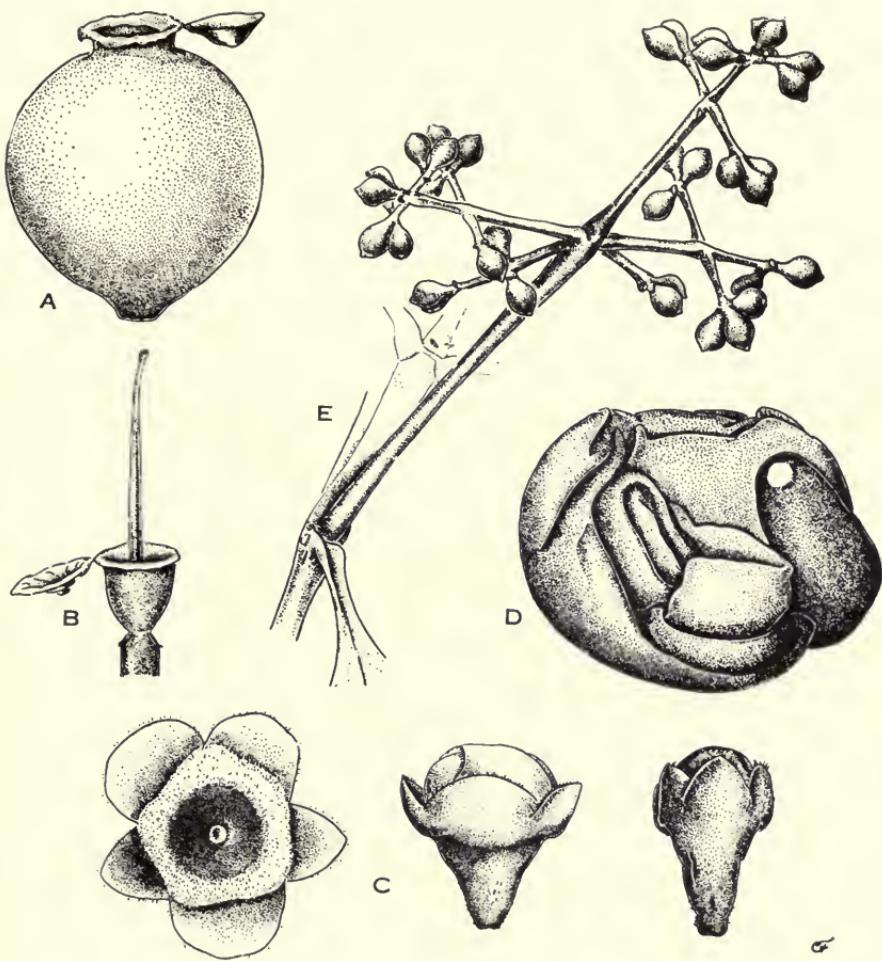


FIG. 49. Flowers and inflorescence in *Calyptanthes* and *Myrcia*. A, Slightly immature fruit of *C. Bartlettii* (*Lundell* 6686); $\times 5$. B, Flower of *C. Calderonii*, slightly past anthesis (*Lundell* 6857); $\times 5$. C, Flower, and buds of two ages, of *M. fallax* (*Gabriel* s.n. in 1802); $\times 10$. The flower is seen from above, the summit of the ovary surrounded by the staminal ring and the five calyx-lobes; the petals, stamens and style have fallen. D, Seed of *C. Chytraculia* var. *americana*, the outer coats removed to show the contorted cotyledons (*Gentle* 1363); $\times 2.5$. E, The myrcoid panicle, in *C. pallens* var. *mexicana*; shown is one of the paired panicles at the base of a leafy shoot (*Wilbur & Wilbur* 1415); $\times 1.5$.

15–20 pairs in addition to numerous intermediate ones; marginal vein equaling or stronger than the laterals and but little arched between them, 1–2 mm. from the margin, usually with a smaller submarginal vein beyond it; leaves dark green and smooth above, paler beneath; glands often obscure; panicles 4–10 cm. long, about 30–60-flowered, 3 (–4) times compound, usually apparently single (not paired), each arising at the lowest node of a new leafy shoot and subtended by a leafy bract 8–25 mm. long; peduncles (2–) 4–6 cm. long; branches of the panicle subtended by foliaceous boat-shaped bracts, the smallest of these (those subtending the terminal clusters of 3 or more sessile flowers) 2–3 mm. long; buds at maturity 4.5–5 mm. long, obovoid, broadly apiculate; calyptra bowl-shaped, about 3 mm. broad; hypanthium at anthesis widely flaring and bowl-shaped; style 9 mm. long; stamens on the margin of the hypanthium, about 100, up to 8–9 mm. long; petals 2 (–3), tiny and strap-shaped, adhering to the inner surface of the calyptra and falling with it; fruit dark red to purple, globose, about 1 cm. in diameter, tipped by a flaring collar 1–2 mm. high and 4–5 mm. wide, the calyptra often persistent as well; seeds lustrous, compressed-orbicular, 5 mm. wide.

Calyptanthes Calderonii Standl. Field Mus. Bot. 4: 318. 1929.

Along a stream, Vaquero, El Cayo District, British Honduras, C.L. Lundell 6857; El Salvador (Cerro de Apaneca, S. Calderón 2423, type).

A shrub or treelet to 3 meters high, the branchlets terete or compressed; plants glabrous except for a few flat reddish-brown dibrachiate hairs (0.1–0.2)–0.5 mm. long, on the youngest vegetative parts; leaves coriaceous, elliptic or elliptic-lanceolate, 1.5–3 cm. wide, 5–10 cm. long, about 3 (2.5–4) times as long as wide, broadly or gradually acuminate at tip, the very tip obtuse; base acute, the margins decurrent on the inner angles of the channeled petiole 7–10 mm. long, 1–1.5 mm. thick; midvein impressed above at least near base; lateral veins 10–12 pairs, obscure in mature leaves; marginal vein about equaling the lateral ones, 0.5–1 mm. from the margin; blades dark green above, paler beneath; glands obscure, the upper surface somewhat impressed-punctate; panicles 4–6 cm. long, 3 times compound, paired at the first node of an abortive axillary branch, or opposite at the lowest (leafless) node of a leafy shoot; peduncle 2–3.5 cm. long, somewhat compressed, 1–1.3 mm. wide at the summit; flowers about 40 or fewer, in 2's and 3's near the tips; buds 2.5–2.7 mm. long, obovoid, apiculate; calyptra domed, 1.5–1.7 mm. wide; hypanthium funnelliform, 1.5 mm. long and wide; style 5–6 mm. long; stamens about 50, up to about 5 mm. long; petals ?0, or 1–2, narrow, attached to the calyptra and falling with it; fruit unknown.

Calyptanthes chiapensis Lundell, Contr. Univ. Mich. Herb. 7: 28. 1942.

Subdeciduous forest, often along streams, 1000 meters or less. To be expected in Guatemala. The type, Matuda 4488, came from Chicomuselo, Chiapas, less than 50 km. from the Guatemala border.

A tree up to 10 meters high, the inflorescence, branchlets and young leaves velutinous with compact purplish-brown tomentum, the mostly upright simple

or forked hairs up to about 1 mm. long; leaves oblong or oblong-ovate, cordate and subamplexicaul, 3.5–7.5 cm. wide, 12–23 cm. long, 3–4 times as long as wide, the tip acute or obscurely acuminate, the base broadly rounded, divided by a narrow sinus into two rounded auricles 5–12 mm. long; petiole scarcely apparent from above in dried specimens, 7–12 mm. long as seen from below including the enlarged basal portion of the costa, 2.5–4 mm. thick including the hairs; midvein as seen from above with central concave channel separating parallel convex ridges; lateral veins 15–25 including some weak intermediate ones, in dried leaves convex but inconspicuous above, well differentiated beneath; marginal vein about equaling the lateral ones and somewhat arched between them, 2–7 mm. from the margin, often with a series of submarginal arches, connected by short straight veins, beyond it; blade lustrous above, paler and dull beneath, obscurely glandular; inflorescence stout, many-flowered, the paired panicles up to 15 cm. long, about 3 times compound, arising from an abortive axillary axis or from the lowermost (bracteate) node of a leafy branchlet, the bracts then lanceolate, foliaceous, up to 2 cm. long; branches of the panicle proliferous, the flowers in small groups near the tips; peduncle 4.5–7 cm. long, up to 4 mm. wide; buds subglobose to ovoid (actually short-apiculate but appearing rounded because of the dense covering of hairs), 3.5–4 mm. long; calyptra shallowly convex, membranous, soon explanate, 3–3.5 mm. wide; style 7 mm. long; stamens about 125, up to 5.5 mm. long, the anthers 0.4–0.5 mm. long; petals 2, minute, narrow, 2 mm. long, attached to the calyptra and falling with it; fruit apparently black, globose to olate or didymous, 7–10 mm. high, 7–12 mm. wide, surmounted by the persistent collar-like neck of the hypanthium 2.7–3 mm. wide.

Calyptranthes Chytraculia (L.) Sw. Prodr. 79. 1788. *Myrtus Chytraculia* L. Syst. Nat. ed. 10. 1056. 1759.

The typical variety of the species is known only from Cuba and Jamaica; the species is represented in Guatemala by the following variety, differing from the var. *Chytraculia* in its somewhat larger leaves and in the paler pubescence (cf. Fieldiana, Bot. 29: 403. 1963).

Calyptranthes Chytraculia var. *americana* McVaugh, Fieldiana, Bot. 29: 404. 1963. *Pimiento; Guayabillo*.

Lowlands, sometimes on limestone, often along rivers or on lake shores, 200 meters or less; Petén (the type from Uaxactún, Bartlett 12447); Alta Verapaz; Izabal. British Honduras; Nicaragua; Panama; northern Colombia.

A tree to 10 meters high, the branchlets terete; inflorescence and often the young branchlets shortly tomentulose with appressed or loosely spreading lustrous pale brown to reddish brown dibrachiate hairs; hairs of the panicles mostly much contorted, loosely appressed and with two equal or strongly unequal branches; hairs of the young leafy branchlets partly as above, partly of nearly straight, erect, simple or short-branched hairs up to 2 mm. long; foliage glabrate; leaves elliptic to ovate or sometimes obovate, (2.5–) 4–6 cm. wide, (5.5–) 7–13 cm. long, 2–2.5 (–3) times as long as wide; blades acuminate at tip, acute to rounded

at base, the margins decurrent on the channeled petiole 7–10 mm. long; midvein impressed above at least near base; lateral veins 12–15 pairs, stronger than the intermediate ones, more prominent on the lower surface; marginal vein about equaling the lateral ones and slightly arched between them, 1–1.5 (–3) mm. from the margin; leaves dark green and probably lustrous above, paler and usually gland-dotted beneath; inflorescence 7–14 cm. long, the principal (paired) panicles mostly 3 times compound, in the axils of terminal nodes of an old branchlet, or sometimes basal and opposite on a leafy shoot from the same node, the peduncles 2–4 (–7) cm. long; flowers often 80–100, mostly in clusters of 3 or more near the tips; buds obovoid, 2–3 mm. long, scarcely apiculate; calyptra dome-shaped, 1.5–1.8 mm. wide, remaining attached at one side (sometimes even in the mature fruit); style 4–5 mm. long; hypanthium hairy inside around the base of the style; stamens about 60, up to 3.5 mm. long; anthers 0.3 mm. wide, broader than long; petals about 2, oblong or irregularly shaped, less than 1 mm. long, adherent to the calyptra and falling with it; fruit globose, red (or yellow?), finally black, about 7 mm. in diameter, glabrous at maturity but usually with some tomentum about the persistent neck of the calyx.

Specimens from Guatemala have been confused with *Calyptranthes Millspaughii*, which is quite a different species, lacking the shaggy pubescence that is characteristic of *C. Chytraculia*.

***Calyptranthes Contrerasii* Lundell, Wrightia 2: 205. 1961.**

In moist or wet forest, at low elevations, 200 meters or less; Petén (Dolores, in high forest, E. Contreras 2360, the type); Alta Verapaz. Endemic.

A tree 6–8 meters high, nearly glabrous; branchlets bicarinate, the wings terminating distally in the median line of the leaf-base; vegetative buds appressed-pubescent with flat rusty dibrachiate hairs about 0.1 mm. long; leaves subsessile, coriaceous, ovate to oblong or elliptic, 1.5–4 cm. wide, 4.5–10 cm. long, 2–2.5 (–3) times as long as wide; tips bluntly pointed or rounded, the base cordate and subclasping, the margins abruptly decurrent on the very stout petiolar base 1.5–2 mm. long and wide; midvein sulcate above; lateral veins 15–20 pairs including some intermediate ones; marginal vein about equaling the lateral ones and somewhat arched between them, 1.5–3 mm. from the margin; leaves "dark green and shining above, pale green beneath" (Steyermark), thickly glandular-punctate above when dry, obscurely glandular beneath; inflorescence a panicle, bracteate at base, simulating a terminal leafy shoot with floriferous branches at its lowest node (as in *C. Bartlettii* and *C. Karlingii*); bracts at the base of the panicle branches 6–7 mm. long, 3 mm. wide; paired panicle branches 2.5 cm. long, 5-flowered, the peduncle 1.5 cm. long, more than 1 mm. wide; buds turbinate, glabrous, 3.5 mm. long, attenuate-stipitate at base, prominently apiculate.

Known only from the type collection, which is in bud, and from a sterile specimen, Steyermark 45628, collected on Cerro Chinajá, between Finca Yalpemech and Chinajá, Alta Verapaz.

***Calyptranthes cuneifolia* Lundell, Am. Midl. Nat. 29: 478. 1943.**

British Honduras, the type from Toledo District, Monkey River, in pine ridge along Jenkins Creek, *P. H. Gentle* 4096.

A tree up to 6 meters high, 15 cm. in diameter, glabrate, the branchlets terete or compressed, the inflorescence and young growth thinly appressed-pubescent with grayish- or yellowish-white dibrachiate hairs 0.1–0.3 mm. long (on vegetative buds up to 0.5 mm. long); leaves coriaceous, obovate, less often elliptic or elliptic-ovate, 1.5–3 cm. wide, (2.5–) 3.5–6.5 cm. long, (1.5–) 2–2.5 (–3) times as long as wide, narrowed to a blunt and often rounded tip (in the more broadly obovate leaves broadly rounded from about the middle); base cuneate, the thick revolute margins decurrent on the inner angles of the channeled petiole 2–3 mm. long, 1 mm. thick; midvein nearly flat above, somewhat sulcate near the base; lateral veins 8–12 pairs, more evident on the lower surface where little stronger than the intermediate and connecting veins, the whole forming an irregular reticulum; marginal vein about equaling the lateral ones, 1–2 mm. from the margins, connecting the lateral veins by ill-defined and irregular arches; blades drying pale gray-green, nearly concolorous, with small dark glands on both sides; inflorescences appearing solitary and axillary, or at the lowest (bracteate) nodes of leafy shoots, 2–5 cm. long; flowers 20–30 in each panicle, short-pedicellate in small groups near the tips; peduncle 1.5–2.7 cm. long, 1–1.5 mm. thick; lateral branches of the panicle 1–2 pairs, 1.5 cm. long or less; buds 2.5–3 mm. long, pyriform, substipitate, densely pale-strigose on the stipe and at the base, glabrous above the middle, rounded or obscurely apiculate at the apex; calyptora 2–2.5 mm. wide; hypanthium after anthesis broadly campanulate, 2.5 mm. wide at the mouth; style 3 mm. long, capitate; stamens 50–60; petals cuneate-obovate, 1–1.5 mm. long, mostly adherent to the calyptora and falling with it; immature fruit globose, up to 8 mm. in diameter, surmounted by a collar 2 mm. wide, up to 1 mm. high.

Calyptranthes hondurensis Standl. Journ. Arnold Arb. 11: 36. 1930. *Eugenia belizensis* Standl. Field Mus. Bot. 11: 137. 1932. *C. belizensis* (Standl.) Lundell, Phytologia 1: 218. 1937. *C. Aguilarii* Standl. & Steyermark. Field Mus. Bot. 23: 128. 1944.

Forested ravines, especially in and along streams, often in pine or oak forest, sometimes in dry situations, 1500 meters or less; Zarcapa; Chiquimula; Guatemala; Quiché (without definite locality, Aguilar 810, type of *C. Aguilarii*); El Progreso. British Honduras (Mountain Pine Ridge, El Cayo District, *H. H. Bartlett* 11756, type of *E. belizensis*); Honduras (the type from El Achote, near Siguatepeque, Dept. of Comayagua, *Standley* 56164).

A shrub or small tree up to 4–5 meters high, at maturity glabrous or essentially so, the young growth and the inflorescence rather loosely and sparsely appressed-pubescent with flat longitudinally oriented yellow-brown or reddish-brown dibrachiate hairs 0.2–0.3 mm. long, these sometimes densely aggregated below the nodes of the panicle-branches, and about the base of the hypanthium; branchlets 2-winged, the wings up to 0.5 mm. high, terminating distally between the leaf-bases; leaves coriaceous, mostly narrow and blunt-tipped, elliptic-ovate

or -ovate, (0.5-) 1-1.8 (-2.6) cm. wide, 2.5-4.5 (-7.5) cm. long, variable in width even on the same plant, on most plants 2-5 (-7) times as long as wide, on others 1.5-3 times, on some 3.5-7 times; blades usually rounded at tip, sometimes long-tapering to a rounded point; base acute or somewhat rounded, the margins rather abruptly decurrent on the inner angles of the broadly channeled petiole 2-5 mm. long, 1-1.5 mm. thick; midvein impressed above at least in the proximal half of the blade; lateral veins about 10-15 pairs, like the marginal vein obscure and hardly apparent in mature leaves; leaves drying pale gray-green, when fresh probably dark green above, paler beneath; glands inconspicuous on both surfaces, the blades sometimes impressed-punctate above; inflorescences axillary, the paired floriferous panicles 5-7.5 cm. long, 2 or 3 times compound, each subtended by a deciduous bract 3-5 mm. long, an elongate leafy branchlet sometimes developed beyond (between) them; peduncle up to 3-4.5 cm. long, somewhat compressed, about 1 mm. wide, usually more than half as long as the whole inflorescence; flowers (10-) 15-25 in each panicle, mostly in 3's at the tips of the branches; principal branches of the panicle one pair, up to 1.5-2.5 cm. long; buds plump, sometimes quite glabrous, 2.5-3.5 mm. long, broadly fusiform to obovoid, distally rather broadly and abruptly rounded to the short broad apiculum, acute or somewhat rounded at the base; calyptra firm-textured, 2.5-3 mm. wide; hypanthium after anthesis broadly campanulate with flaring margins, 3-3.5 mm. wide; style 5-7 mm. long; stamens about 100, up to 5 mm. long; petals about 2, 1-1.5 mm. long, narrow, adhering to the inner surface of the calyptra and falling with it; fruit first red, black at maturity, probably globose, 4-6 mm. in diameter, surmounted by a prominent collar.

The plant described as *Eugenia belizensis* was distinguished as a species on the basis of its "small and remarkably narrow leaves." The leaves in the type collection are indeed narrow (4-7 times as long as wide) but are not smaller than other specimens of *C. hondurensis*. In the type of *E. belizensis* the blades are also more acutely pointed and more prominently glandular-punctate above than is usual in *C. hondurensis*. In view of the very considerable variability in the foliage of individual plants of the latter species, it does not seem that *E. belizensis* should be accorded specific rank on the basis of foliage-characters alone. The type of *C. Aguilarii* is almost entirely glabrous, including the flower-buds, but does not seem to differ otherwise from *C. hondurensis*.

Calyptranthes Hylobates Standl. ex Amsh. Ann. Missouri Bot. Gard. 45: 169. 1958.

Rain-forests in lowlands; to be expected in Guatemala. Mexico (Chiapas, Escuintla, *Matuda* 16873); Nicaragua; Costa Rica; Panama (Prov. Bocas del Toro, Almirante, *Cooper* 366, type).

Tree 4-7 meters high, up to 10-12 cm. in diameter, glabrous except for a few tiny reddish dibrachiate hairs 0.1 mm. long at the base of the hypanthium and on new growth; branchlets 4-angled, corky-winged, 2 low wings or angles

terminating distally in the median lines of the leaf-bases, the other pair more distinctly winglike, terminating between the leaf-bases in straight or falcate linear auricles 1.5–2.5 mm. long; leaves ovate or lance-ovate, 1.5–2.5 cm. wide, 4–8 cm. long, (2–) 2.5–3 times as long as wide, acuminate or caudate-acuminate, rounded or somewhat cuneate at base, the margins decurrent on the inner angles of the petioles 1.5–2.5 mm. long, 0.7 mm. thick; midvein impressed above in a narrow concave channel near the base of the blade; lateral veins obscure, rather close and parallel, about 10–20 pairs; marginal vein about 1 mm. from the margin; blades darker and obscurely glandular above, somewhat or scarcely glandular beneath; inflorescences paired from an abortive compressed axis 1–1.5 mm. long, the filiform panicles 2–4.5 cm. long, the axis 0.25–0.3 mm. thick; flowers 3 (–5?), on filiform pedicels 2–6 (–15) mm. long, one pair opposite and lateral at a node about 2–3 cm. above the base of the branch, the third one terminal; buds obovoid, 2.5–3.5 mm. long including the narrow apiculum 0.5–0.7 mm. long and a conic pseudostalk about the same length; calyptra deeply bowl-shaped, about 1.5 mm. across the mouth and 0.8 mm. high exclusive of the apiculum; hypanthium about 1 mm. long, broadly campanulate with flaring and revolute margin; style 4 mm. long; stamens 60–70, up to 4 mm. long; anthers about 0.3 mm. long; petals apparently none; fruit globose, probably about 5 mm. in diameter, with prominent convex glands.

Calyptranthes Karlingii Standl. Field Mus. Bot. 8: 29. 1930.

Moist forests, river-bank forests, near sea level; Petén; Izabal. British Honduras, the type from Tower Hill Estate, J. S. Karling 39; Mexico (Tabasco, Chiapas).

A small tree, up to 5 meters high, 20 cm. in diameter; branchlets somewhat quadrangular, carinately angled below the median lines of the leaf-bases, and with thin, definite winglike ridges up to 0.5 mm. high, terminating distally between the leaf-bases; inflorescence, and the young branchlets and foliage, thinly pubescent with flat appressed pale rusty longitudinally oriented dibrachiate hairs 0.1–0.2 mm. long; leaves coriaceous, lanceolate or occasionally elliptic-lanceolate, nearly sessile, 1.5–3.5 cm. wide, 5–9 (–12) cm. long, 2.5–3.5 (–5) times as long as wide, acute at tip (varying to obtuse or to obscurely acuminate), broadly rounded and subcordate at base, the margins abruptly decurrent on the stout adaxially concave petioles 1–3 mm. long, 1–2.5 mm. thick; midvein shallowly or narrowly sulcate above; lateral veins obscure above and somewhat more evident beneath, often 20 or more pairs including some smaller ones; marginal vein about equaling the lateral ones and slightly arched between them, 1–1.5 mm. from the margin; glands usually apparent as minute dark dots above, or the upper leaf-surface punctate, the lower surface sometimes glandular also; blades dark green and lustrous above, paler beneath; panicles 3–7 cm. long, with about 30 flowers or fewer, 2–3 times compound, usually appearing single (not paired), each arising at the lowest node of a new leafy shoot and subtended by a leafy bract 10–12 mm. long; peduncles 1.5–4 cm. long, like the panicle branches somewhat angled and compressed; bracts of the panicle deciduous before full anthesis, glabrous, oblong-boat-shaped, the smaller ones (those subtending the terminal clusters of 3 flowers or the bracteole-like ones at the bases of individual flowers) 1.5–2 mm. long; buds at maturity 3–4 mm. long, prominently gland-dotted, obovoid, or ellipsoid

and more or less equally contracted to the substipitate base and the prominently apiculate tip, the base or the entire bud often pale scurfy and appressed-pubescent as well; calyptra bowl-shaped, 2 mm. broad; hypanthium at anthesis turbinate with somewhat revolute margins, not lobed or divided; style 5 mm. long; stamens on the margin of the hypanthium, 60–75, up to 4 mm. long; petals 1 or 2, narrow, 2 mm. long, adhering to the inner surface of the calyptra and falling with it; fruit globose or oblate, often somewhat didymous or tridymous, 6–9 mm. in diameter, tipped by a flaring collar about 1 mm. high, 2.5 mm. wide, the calyptra sometimes present as well.

***Calyptranthes Lindeniana* Berg, Linnaea 29: 213. 1858. *C. fluviatilis* Lundell, Bull. Torrey Club 64: 553. 1937.**

Forests along streams, river banks, 500 meters or less; Alta Verapaz (Pittier 231, 299). British Honduras (El Cayo, H. H. Bartlett 12949, type of *C. fluviatilis*); southern Mexico (Tabasco, Linden 620, type).

A shrub or treelet 2–3 meters high, the branchlets terete or somewhat compressed, soon glabrate; young branchlets and inflorescence softly tomentose with pale reddish brown hairs, those of the panicles mostly much contorted, loosely appressed and with two equal or strongly unequal branches; hairs of the young leafy branchlets partly as above, partly of nearly straight, erect, simple or short-branched hairs up to 2 mm. long; leaves narrowly elliptic, lanceolate or oblanceolate, 1–2.3 cm. wide, (5.5) 7–8 (–11) cm. long, 4.5–6 times as long as wide, about equally narrowed to both ends, the tip slenderly acuminate (the narrow acumen 1–2 cm. long), the base acute, the margins decurrent on the inner angles of the channeled petiole 6–8 mm. long, 1.2 mm. thick; midvein sulcate above at least near base; veins except the midvein obscure above, the lateral ones 15–20 pairs in addition to some intermediates, ascending, straight; marginal vein about equaling the laterals and little arched between them, 0.5–1 mm. from the margin; blades probably dark green above, nearly featureless when dry, the lower surface paler with indistinct glands; inflorescence 3–7 cm. long, 3 times compound, the panicles paired in the axils of terminal nodes of an old branchlet, or sometimes basal and opposite on a leafy shoot from the same node and then subtended by bracts up to 8 mm. long; peduncle 2–3.5 cm. long; flowers up to about 40, in twos and threes at the tips; buds obovoid, 2.3–2.7 mm. long, rounded at the tip, usually weakly apiculate; calyptra dome-shaped, 1.7–2 mm. wide; hypanthium funnel-form or campanulate with revolute margins, hairy within at the base of the style; style about 7 mm. long; stamens about 75; petals 1–2, narrow, 1 mm. long, adherent to the calyptra and falling with it; fruit probably globose, ?black, less than 1 cm. in diameter, surmounted by a collar.

A species not very distinct from *Calyptranthes Chytraculia*, and resembling the latter closely in all morphological details, including the distribution and quality of the pubescence. It is probable that the two species are closely related. The very narrow leaves of *C. Lindeniana*, however, are distinctive, and its flowers are somewhat larger than those of *C. Chytraculia*.

Calyptanthes macrantha Standl. & Steyermark. Field Mus. Bot. 23: 127. 1944.

Known only from the type collection, Alta Verapaz, wet mixed forest along banks of Río Frío, about 8 km. below Tactic, 1400 meters, Standley 90532.

A shrub with terete or compressed branchlets; branchlets, inflorescence, and petioles brown-tomentose with coarse erect or matted simple or forked hairs up to 1.3–1.5 mm. long; leaves elliptic-ovate, 10–14 cm. long, 5–6.5 cm. wide, 2–2.3 times as long as wide, obscurely acuminate (the very tip obtuse), rounded at base, the margins somewhat cuneately decurrent on the inner angles of the deeply channeled petiole 8–11 mm. long, 1.7–2.5 mm. thick; midvein deeply and narrowly impressed above; lateral veins 15–20 on each side, slightly impressed above when dry, straight and parallel, more prominent beneath; marginal vein about equaling the lateral ones and arching between them, forming a well-defined border 1.5–3 mm. from the margin; blades dark green, smooth and somewhat impressed-punctate above, paler and sparingly gland-dotted beneath; inflorescence of paired panicles from an abortive axillary axis, the panicles 7–8 cm. long, up to 4 cm. across, about twice compound, about 15–20-flowered, the peduncle 3.5–4.5 cm. long, 3 mm. wide including the hairs; buds ovoid, sessile, in groups of 2–4 at the tips of the panicle-branchlets, obtuse or apiculate, 4.5–6 mm. long, 3–4 mm. in diameter including the hairs, the conic apiculum 1 mm. long when denuded; hypanthium prolonged 2.5 mm. beyond the ovary; style not seen expanded; stamens about 150, the anthers up to more than 0.5 mm. long; petals 1 (–2), minute, attached to the calyptro and falling with it; fruit unknown.

Calyptanthes megistophylla Standl. Carnegie Inst. Wash. Publ. 461: 75. 1935.

Known only from the type collection, British Honduras, in forest, Camp 32, British Honduras-Guatemala boundary, 810 meters, W. A. Schipp 1265.

A tree 15 meters high, 30 cm. in diameter, the inflorescence and young herbaceous sparingly appressed-pubescent with flat minute reddish dibrachiate hairs 0.1–0.2 mm. long; leaves in age glabrous or nearly so, very large for the genus, ovate-lanceolate, up to 12 cm. wide and 35 cm. long, obscurely short-acuminate, rounded at base, the margins cuneately decurrent on the petioles 8–13 mm. long, 3–4 mm. thick; midvein on the upper surface with a central concave channel separating two low parallel convex ridges; lateral veins close and parallel, 30–40 or more including some intermediate ones; marginal vein about equaling the lateral ones and slightly arched between them, forming a prominent bordering line 2–5 mm. from the margin; blades probably lustrous above, paler and dull beneath, somewhat gland-dotted beneath; inflorescence very large, the paired panicles in the type probably arising from an abortive axillary axis; panicles 15–22 cm. long, 3 or 4 times compound, many-flowered, trichotomously branched in one plane at the principal nodes, the internodes above these nodes strongly flattened at right angles to the plane of the branchlets; peduncle up to 12.5 cm. long and 5 mm. wide; flowers in dense clusters of 6–12 at the tips of the branchlets; buds

glabrous except at the base, obovoid or almost globose, scarcely apiculate, 3–3.5 mm. long; calyptra about 3 mm. wide, membranous, gland-dotted; hypanthium funnelform after anthesis, 2.5 mm. long; style about 5 mm. long; stamens about 100, up to 5 mm. long, the anthers 0.3 mm. long and wide; petals 1 or more, elliptic, half as long as the width of the calyptra and falling with the calyptra; fruit unknown.

Calyptranthes Millspaughii Urb. Symb. Antill. 7: 294. 1912.
C. euryphylla Standl. Contr. U. S. Nat. Herb. 23: 1034. 1924. *Walk Naked.*

Along streams, near sea level. British Honduras, Stann Creek Dist., Freshwater Creek, *J. Kelly* no. 1. Yucatan Peninsula of Mexico (Cozumel Island, *Millspaugh* 1537, the type); Veracruz (*Nelson* 421, the type of *C. euryphylla*).

A tree or shrub, the branchlets and inflorescences rather thinly pubescent with longitudinally oriented closely appressed flat coppery dibrachiate hairs 0.2–0.4 mm. long; branchlets compressed, not 2-edged; leaves elliptic to elliptic-ovate or -obovate, 2.5–4 cm. wide, 6–12 cm. long, 2.25–3 times as long as wide, gradually acuminate at the tip, acute at base, the margins decurrent on the inner angles of the concave-channelled petiole 4–7 mm. long; midvein concave above on the nearly plane surface of the rather thick and opaque blade; lateral veins 10–12 on each side in addition to some intermediate ones, inconspicuous, scarcely convex in dried leaves even on the lower surface; marginal vein about as strong as the lateral ones and arched between them, 2–3.5 mm. from the margin; blades dark green and often impressed-punctate above, paler and drying brown beneath and finely dark-dotted; inflorescence 4–6 cm. long, the paired panicles mostly 3 times compound, 30–40-flowered, in the axils of terminal nodes of old leafy branchlets, or occasionally basal and opposite on a leafy shoot from the same node, the peduncles 1.5–3 cm. long; principal secondary branches of the panicle much flattened, their lowest internodes often 6–8 mm. long, 1.5 mm. wide; flowers mostly in clusters of 3–5 near the tips; buds obovoid, apiculate, 2.5–2.8 mm. long; calyptra dome-shaped, membranous, 2 mm. wide; funnel-form hypanthium after opening 1.5 mm. long, 2 mm. wide at the mouth, glabrous within; style 4–5 mm. long; stamens about 50, up to 4 mm. long, the anthers 0.4 mm. long; petals minute, adherent to the calyptra and falling with it.

This species is known only from the collections cited above. Two are flowering specimens, that from British Honduras collected in early March, the type in mid-February. The fruit is unknown. Probably the whole plant is glabrous or nearly so by the time the fruit matures.

Formerly *C. Millspaughii* was confused with *C. Chytraculia*, from which it may be distinguished most readily by the distinctively different pubescence.

Calyptranthes pallens Griseb. Veg. Kar. 67. 1857. *C. Chytraculia* δ *pauciflora* Berg, Linnaea 27: 27. 1855.

A tree or tree-like shrub 5–8 meters high; leaves coriaceous, rather broadly elliptic, or sometimes broadest a little above or below the middle, narrowed about equally to both ends, 2–4 (–6) cm. wide, 3–7 (–10) cm. long, 2–3 (–3.5) times as long as wide; margins of the blade decurrent at the base on the inner angles of the channeled petiole; midvein impressed above at least near the base; lateral veins close and parallel, obscure on both surfaces, 10–20 pairs including some poorly defined intermediate ones; marginal vein about equaling the lateral ones and slightly arched between them, 0.5–1.5 mm. from the margin; leaves smooth and dark green above; panicles usually bracteate and paired at the base of an otherwise leafy shoot, sometimes axillary on ordinary leafy branches, the individual panicles pyramidal, 3–4 times compound, the flowers in small clusters near the tips, not appearing closely sessile; peduncles 2–5 cm. long; buds 2.5–3 mm. long including the narrow base, obovoid, rounded and often slightly apiculate; calyptra domelike; hypanthium after opening campanulate, 2 mm. long; style 4–5 mm. long; stamens about 50–60, up to 3.5 mm. long; petals tiny, adhering to the calyptra and falling with it; ripe fruit dark red, globose or oblate, 5–8 mm. in diameter.

A species primarily of the Caribbean basin, the nomenclaturally typical variety occurring in the West Indies, southern Florida, the Yucatan Peninsula, and the Isthmus of Tehuantepec, Mexico. The two following varieties may be expected to occur in Guatemala. For notes on the taxonomy of this species see *Fieldiana, Bot.* 29: 406–409. 1963.

***Calyptanthes pallens* Griseb., var. *pallens*.**

Lowlands, to be expected in Petén and British Honduras. Mexico (Yucatán; Isthmus of Tehuantepec); southern Florida; West Indies.

Vegetative branches prominently 2-winged, the wings terminating distally between the leaf-bases; inflorescence, branchlets, and to some extent the foliage, rather persistently appressed-pubescent with pale rusty-brown, yellowish brown or, especially on the leaves, nearly colorless dibrachiate hairs 0.1–0.3 mm. long; leaves prominently acuminate at tip, broadly cuneate at base, usually glandular-punctate above; petioles 6–8 mm. long; panicles 10–12 cm. long or less, usually with 50–60 or more flowers, the lowest branches often as long as the peduncles, the latter 2–4 cm. long; calyptra 1.3–1.7 (–2) mm. across.

***Calyptanthes pallens* Griseb., var. *mexicana* (Lundell)**
McVaugh, *Fieldiana, Bot.* 29: 409. 1963. *C. mexicana* Lundell,
Wrightia 2: 166. 1961.

Arroyos, brushy slopes, stream-sides, mountain forests, to be expected in Guatemala. Mexico (Chiapas to Sinaloa).

Vegetative branches winged or wingless, the wings sometimes apparent only on a few of the young branchlets of individual plants; inflorescence and branchlets very sparingly pubescent, the appressed and usually coppery hairs mostly 0.1–0.2

mm. long, and aggregated chiefly about the base of the hypanthium and the distal nodes of the panicle; leaves acuminate at tip (sometimes obscurely so or some leaves merely obtusely rounded), acute or sometimes cuneate at base, often glandular-punctate above; petioles 2.5–5 mm. long; panicles 3–7.5 cm. long, 30–35-flowered, the lowest branches shorter than the peduncles, the latter 2–4.5 cm. long; calyptora 2–2.5 mm. wide.

Calyptanthes paxillata McVaugh, Fieldiana, Bot. 29: 410. 1963.

Known only from the type collection, Guatemala, Alta Verapaz, wet forest above Tactic, above the bridge across Río Frío, about 1400–1500 meters, Standley 90457.

A small tree with nearly terete or compressed branchlets; branchlets, inflorescence and young foliage covered with appressed nearly sessile, dibrachiate and longitudinally oriented coppery hairs 0.5–1 mm. long; leaves glabrate, elliptic or elliptic-lanceolate, 1.5–3.5 cm. wide, 4–7 cm. long, 2.3–3 times as long as wide, caudate-acuminate, the slender tapering tip 1–1.5 cm. long, obtuse; base of blade acute or cuneate, the margins decurrent on the inner angles of the petiole 3–6 mm. long, 0.8–1.2 mm. thick; midvein channeled above near base; lateral veins obscure, close and parallel, about 15 on each side including some intermediate ones; marginal vein about equaling the lateral ones, nearly straight between them, 1 mm. from the margin; inflorescence of paired panicles from an abortive axillary axis or from the lowermost (bracteate) node of a leafy shoot; panicles 3–4.5 cm. long, twice compound, bearing 9 flowers or fewer; peduncle up to 3.5 cm. long, compressed, 1 mm. wide below the lowest branches; buds obovoid-fusiform, 4.5–5 mm. long, 2–2.5 mm. in diameter, broadest above the middle, tapering to the base, rather abruptly contracted to a blunt peglike apiculum 1–1.3 mm. long; hypanthium after anthesis funnelform, 2.5–3 mm. high, the rim prolonged 2 mm. beyond the summit of the ovary; calyptora about 3 mm. across, 2.5 mm. long including the apiculum; style 7–8 mm. long; stamens about 100, up to 4 mm. long; petals 1–2, minute, remaining attached to the calyptora and falling with it; fruit globose, glabrous, about 8 mm. in diameter, surmounted by the collar-like base of the hypanthium 2.5 mm. wide.

Calyptanthes pendula Berg, Linnaea 27: 21. 1855.

Mountain slopes in wet forest, or on dry rocky hillsides, 900–1900 meters; Escuintla; San Marcos; Quezaltenango; Sacatepéquez. Mexico (Oaxaca, Galeotti 2870, the type; Chiapas); El Salvador.

A tree or tree-like shrub 5–8 meters high, the vegetative branchlets slightly compressed, not 2-edged; inflorescence and young branchlets, and to some extent the foliage, rather sparingly appressed-pubescent with crisped pale rusty-brown or nearly colorless dibrachiate hairs 0.1–0.3 mm. long, the hairs often densely aggregated and coppery about the base of the hypanthium, paler and often evanescent elsewhere in the inflorescence; leaves coriaceous, rather broadly elliptic or elliptic-ovate, 3–4 cm. wide, 7–12 cm. long, 2–3 times as long as wide, gradually but prominently acuminate at tip, rounded or sometimes merely acute at the base,

the margins decurrent on the inner angles of the petiole 8–10 mm. long; mid-vein impressed-concave above at least near base; lateral veins close and parallel, 10–20 on each side including some poorly defined intermediate ones, more evident beneath; marginal vein about equaling the lateral ones and arched between them, 1.5–2.5 mm. from the margin; mature blades smooth and dark green and without apparent glands above, paler beneath; panicles usually bracteate and paired at the base of an otherwise leafy shoot, sometimes axillary on ordinary leafy branches, the individual panicles pyramidal, 3–4 times compound, 5–10 cm. long, often 50–60-flowered, the flowers in small clusters near the tips; peduncles 3–5 (–8) cm. long, the lowest secondary panicle branches shorter than this; buds 2.5–3 mm. long, obovoid, rounded and slightly apiculate at tip; calyptra membranous, domelike, 1.7–2 mm. across; hypanthium after opening campanulate, 2 mm. long; style 4–5 mm. long; stamens 50–60, up to 3.5 mm. long; petals tiny, adhering to the calyptra and falling with it; fruit dark red or black, globose or oblate, 5–8 mm. in diameter.

The taxonomic position of this species is somewhat doubtful. It is similar in the characteristics of the inflorescence and especially of the pubescence to *C. pallens* Griseb. From the Central American and Mexican varieties of *C. pallens*, however, *C. pendula* may be distinguished by its larger leaves, which are often rounded at base and usually apparently eglandular above, by its longer petioles, and by the absence of wing-like angles on the leafy branchlets. From *C. Chytraculia*, flowering specimens of *C. pendula* may be distinguished readily by the differences in abundance and quality of the pubescence. Fruiting specimens, from which most of the pubescence has disappeared, may be difficult to identify. As far as known *C. Chytraculia* is confined to lowlands near the Atlantic Coast, whereas *C. pendula* is a species of middle elevations. From *C. Millspaughii*, a species of the lowlands of the Yucatán Peninsula, *C. pendula* may be distinguished by the more slender inflorescence and the usually somewhat crisped pubescence.

***Calyptranthes perlaevigata* Lundell, Contr. Univ. Mich. Herb. 7: 29. 1942.**

Subdeciduous forest, river-banks, 500–1500 meters. To be expected in Guatemala. The type, Matuda 4387, came from near Siltepec, Chiapas, less than 50 km. from the Guatemala border.

A tree 3–5 meters high, glabrous as far as known except for a few sessile reddish dibrachiate hairs 0.2–0.3 mm. long, on the vegetative buds, the branches of the panicle, and the base of the hypanthium; leaves elliptic, or sometimes broadest above the middle, 3–6 cm. wide, 10–16 cm. long, 2–3 times as long as wide, rounded distally to a tapering acumen up to 1–2 cm. long, rounded below the middle to a broadly acute or cuneate base, the thick and somewhat revolute margins cuneately decurrent on the inner angles of the ventrally concave petiole

5–9 mm. long, 1.5 mm. thick; midvein channeled above near base, for most of its length with a shallow central channel separating low convex parallel ridges; lateral veins close and parallel, 20 or more on each side including some intermediate ones, ascending, inconspicuous but apparent on both surfaces; marginal vein about equaling the lateral ones and arched between them, forming a firm line nearly parallel to the margin and 1.5–3 mm. from it; blades lustrous and abundantly but minutely impressed-punctate above, sparingly resinous-dotted beneath; inflorescence relatively short and about 9-flowered, the paired panicles (2–) 5–8 cm. long, arising from an abortive axillary axis or from the lowest (bracteate) node of a leafy branchlet; peduncles 3.5–6 cm. long, up to 1.7 mm. wide, more than half as long as the whole panicle; lateral flower-bearing branchlets usually one pair, 5 mm. long and 3-flowered, but the lateral flowers sometimes sessile on the main axis; buds before anthesis broadly fusiform, obtuse, 7–8 mm. long; calyptra conic, 4 mm. high, 4 mm. in diameter; hypanthium after anthesis campanulate with flaring margins, 4 mm. long; style about 11 mm. long; stamens about 100, up to 7 mm. long, the anthers 0.5–0.7 mm. long; petals not seen; calyptra (persistent on the fruit) up to 4.5 mm. wide, obtusely broad-conic, thickened, apparently fleshy, 2 mm. high; fruit globose or oblate, probably up to 1 cm. in diameter, the persistent collar-like neck of the hypanthium up to 2 mm. high, its rim 4 mm. wide.

Calyptanthes zanquinensis A. Molina, Ceiba 3: 168. 1953.

To be expected in Guatemala. Known only from *Liquidambar* forest, Honduras, Dept. of Morazán, Montaña Zanquín, Quebrada de la Paz, 1600 m., A. Molina R. 2977, the type.

A tree 5 meters high, with compressed branchlets; inflorescence, branchlets and petioles bristly-tomentose with very coarse hollow erect somewhat ascending pale yellowish-brown forked hairs up to 0.3–0.7 mm. high; leaves elliptic to ovate-lanceolate, (2–) 2.5–4 cm. wide, (7–) 9–12 cm. long, 2.6–3.4 times as long as wide, gradually acuminate with tapering tip, rounded from the middle or below toward an acute base, the margins finally somewhat cuneately decurrent on the acute inner angles of the channeled petiole 5–7 mm. long; midvein sulcate above; lateral veins 12–15 pairs including some intermediate ones, inconspicuous above, evident beneath; marginal vein about equaling the lateral ones and slightly arched between them, 1–2 mm. from the margin; leaves nearly concolorous, lustrous and obscurely impressed-punctate above, the glands scarcely apparent beneath; paired panicles from the lowermost (bracteate) nodes of a leafy axillary branch, the bracts foliaceous, lanceolate, 18 mm. long, 4 mm. wide; panicle 10 cm. long, 2 or 3 times compound, the peduncle 4–6 cm. long, up to 2 mm. wide at the apex; buds clustered near the tips, obovoid, about 5 mm. long; hypanthium after anthesis campanulate, flaring at the mouth, 3–4 mm. long; style about 7 mm. long; stamens probably about 150, up to 4–6 mm. long, the anthers 0.4 mm. long; calyptra dome-shaped, 2.5 mm. wide, 2 mm. high including the slender apiculum 1 mm. long; petals 2–3, minute, attached to the calyptra and falling with it; fruits mostly solitary on short pedicel-like branchlets, apparently black, nearly globose, about 8 mm. in diameter, surmounted by a prominent collar-like rim 2.7–3.2 mm. wide.

EUGENIA L.

References: Berg, Linnaea 27: 140–306. 1856; and in Mart. Fl. Bras. 14, pt. 1: 214–326. 1857.

Calyx-lobes 4, distinct and imbricated in bud and in anthesis, and usually persistent on the fruit (in some species loosely coherent below the tips until anthesis). Hypanthium little or not at all prolonged beyond the summit of the ovary. Petals as many as the calyx-lobes, usually conspicuous. Ovary usually bilocular, the ovules numerous (or rarely only 2) in each locule, usually in a subcapitate group attached near the middle of the central dissepiment. Seeds one or two, the ovules as far as known undivided, pseudomonocotyledonous, the separate structures of cotyledon, radicle and plumule not discernible. Inflorescence fundamentally a raceme, i.e. the individual flowers in decussate pairs; terminal flower of the axis usually wanting; axis sometimes extremely shortened, the flowers then appearing as if in axillary fascicles, umbels or glomerules; flowers, if occasionally solitary, arising from the basal bracteate nodes of new branches that bear leaves at the upper nodes, or from the bracteate nodes of abortive axillary axes; bracteoles at base of flower often broad and persistent, sometimes connate. Fruit a "berry," usually with thin pulp over the massive seed.

One of the very large genera of flowering plants; the American species, according to an estimate made by Berg in 1859, number 537. The actual number may be smaller than this; according to Bentham the whole genus includes no more than about 500 species. According to Merrill and Perry (Mem. Am. Acad. 18, pt. 3: 136. 1939) about 2500 species in the New and the Old Worlds have been described in, or transferred to, *Eugenia*. The limits of the inclusive genus *Eugenia* have been the subject of much controversy. Many modern authors prefer to segregate the very numerous species of southeastern Asia as a distinct genus, *Syzygium* Gaertn. (see below). American authors generally have been reluctant to recognize the segregate genera proposed by Berg, e.g. *Stenocalyx*, *Phyllocalyx*, *Siphoneugena*, *Myrcianthes* and *Myrciarria*. For the sake of convenience the few Old World Eugenias introduced into Guatemala may be treated as forming a distinct section, distinguished as follows:

Hypanthium much prolonged beyond the summit of the ovary, forming a funnel-form, campanulate or bowl-shaped "calyx-tube" bearing the stamens about its margin; base of the hypanthium attenuate above the place of attachment of the deciduous bracteoles into a narrow stipelike pseudostalk; inflorescence terminal or if lateral then usually at leafless nodes on old wood; natives of the Old World, cultivated or escaped.....Sect. *Syzygium* (p. 310).

Hypanthium not much prolonged beyond the summit of the ovary, the stamens borne on a flat disk surrounding the base of the style and at about the same level (the base of the style sometimes in a shallow concave depression); base of the hypanthium usually not stipelike, the expanded portion of the hypanthium subtended (usually closely) by a pair of bracteoles, these mostly persistent until well after anthesis; inflorescence always lateral, usually at leafy nodes; native American species.....Sect. *Eugenia* (p. 315).

Sect. I. **SYZYGIUM**, sensu M. R. Henderson, Gard. Bull. Singapore 12: 11. 1949.¹

There has been no general agreement on the validity of *Syzygium* as a genus distinct from *Eugenia*. Merrill and Perry, in studies on the Myrtaceae of China and of Borneo, respectively (Journ. Arnold Arb. 19: 191–247. 1938; and Mem. Am. Acad. 18: 135–202. 1939), argued for the separation of *Syzygium* on the basis of the divided embryo (i.e. the distinct cotyledons) and the roughish seed coat “loosely or closely adhering to the pericarp.” In this stand they have been followed by perhaps a majority of recent workers on Old World Myrtaceae. In his comprehensive treatment of *Eugenia* in Malaya, however, Henderson maintained after study of various living species that neither the characteristics of the seed coat nor those of the embryo can be used as a reliable basis for generic distinction. Henderson thus proposed to regard *Syzygium* as a section of *Eugenia*, distinguished from *Eugenia* proper chiefly by having the “calyx-tube” (hypanthium) prolonged above the ovary, with the stamens borne along the margin of the tube.

Recent studies on wood anatomy and on pollen morphology suggest that there may indeed be some valid basis for the division of the inclusive genus *Eugenia* and the recognition of *Syzygium* (Ingle, H. G., & Dadswell, H. E., The Anatomy of the Timbers of the South-West Pacific Area. III. Myrtaceae. Austral. Journ. Bot. 1: 353–401. 1953; Pike, Kathleen M., Pollen Morphology of Myrtaceae from the South-West Pacific Area. op. cit. 4: 13–53. 1956).

In Asia, Malaya and Australia there are numerous native species of *Syzygium*. A few species have been introduced into America for ornament. One species not treated below, *S. samaragnense* (Blume) Merr. & Perry (*Eugenia javanica* Lam.), has been reported from Panama.

Inflorescence compound (i.e. a panicle, its lower branches branched again, bearing several or many flowers); panicle usually lateral at leafless nodes, sometimes terminal; buds calyptrate, circumscissile, the petals falling as a unit and the truncate margin of the hypanthium persisting as a tube or collar in flower and in fruit.....*E. Cumini*.

Inflorescence a raceme, the branches (“pedicels”) 1-flowered (occasionally in *E. myrtifolia* 3-flowered); raceme terminal or lateral; calyx-lobes 4, persistent and conspicuous in flower and in fruit.

¹ This name was derived from the generic name *Syzygium* Gaertn., published in 1788. It was published as a sectional name without Latin description and without any specific reference to the original publication as a genus. It is used here more or less in the sense of Henderson, merely as a convenient way of designating the small group of Asiatic species that are cultivated or naturalized in Guatemala. Nomenclaturally it is probably unacceptable.

- Flowers very large (buds 1.5–3 cm. long including the pseudostalk; style 2.5–4 cm. long; calyx-lobes up to 1–1.5 cm. wide); fruit 2.5–6 cm. in diameter. Flowers pink to red, nearly sessile in crowded lateral clusters. *E. malaccensis*. Flowers white, or somewhat greenish or yellowish; pedicels mostly 1–1.5 cm. long; raceme usually terminal, not crowded. *E. Jambos*. Flowers smaller (buds 6–8.5 mm. long; style 8–10 mm. long; calyx-lobes 3 mm. wide or less); fruit probably about 1 cm. in diameter or less; inflorescence terminal, racemose, or the flowers on the most vigorous branches subumbellate in threes. *E. myrtifolia*.

Eugenia Cumini (L.) Druce, Rep. Bot. Exch. Club Brit. Isles 3: 418. 1914. *Myrtus Cumini* L. Sp. Pl. 471. 1753. *E. jambolana* Lam. Encyc. 3: 198. 1789. *Syzygium Cumini* (L.) Skeels, U. S. Dept. Agric. Bur. Pl. Ind. Bull. 248: 25. 1912. *Calyptranthes O'Neillii* Lundell, Bull. Torrey Club 64: 554. 1937 (type from an old clearing near Belize, British Honduras, H. O'Neill 8764).

Cultivated grounds about towns and villages, spreading from cultivation in many parts of the tropics. British Honduras; Surinam; Brazil; widely distributed in the Indo-Malaysian region, introduced in other tropical regions.

Tree 6–20 (~30) meters high, glabrous; leaves coriaceous, oblong-ovate to elliptic-oblong, 3–8 cm. wide, 7–18 cm. long, 2.5–3 times as long as wide, the tip shortly or abruptly acuminate, rarely obtuse; base acute to cuneate, the margins decurrent on the channeled petiole 1–2.5 cm. long, 1–2 mm. thick; midvein broadly sulcate above; lateral veins 25–40 pairs in addition to some intermediates, slightly elevated on both surfaces when dry; marginal vein about equaling the laterals and somewhat arched between them, 1–3 mm. from the margin; blades olive-green and lustrous above, paler beneath, both surfaces often finely glandular-punctate; inflorescence many-flowered, sometimes terminal, often lateral at leafless nodes below the tips of the branches, cymose-paniculate, 3 or 4 times compound, 4–12 cm. long with several pairs of distant horizontal branches, the peduncle 1–3 cm. long, the flowers sessile in groups of 3 or more near the tips; bracteoles and upper bracts similar, deciduous at or before anthesis, reddish brown, deltoid, acute, 0.5–1.5 mm. long; buds pyriform, 5–6 mm. long, rather abruptly contracted below into a stout pseudostalk 1 (~2) mm. long; calyx truncate, 2.5–3 mm. across the mouth, brownish-pink, the tube prolonged 1.5–2 mm. above the ovary, the 4 lobes very broad and low, obscure, quickly deciduous; style 5–7 mm. long; stamens about 100, inserted on the margin of the calyx tube; filaments pinkish, 2–6 mm. long; petals falling in a flat orbicular calyptra ca. 2.5 mm. in diameter; ovary bilocular, the ovules 12–15 in a compact group near the summit of each locule; fruit black when ripe, edible, oblong to oblong-ellipsoid, asymmetric, 1.5–2 cm. long, 1–1.5 cm. wide, umbilicate; seed 1–1.5 cm. long, the two cotyledons unequal, not fused.

Eugenia Jambos L. Sp. Pl. 470. 1753. *Jambosa vulgaris* DC. Prodr. 3: 286. 1828. *Syzygium Jambos* (L.) Alston, in Trimen, Fl.

Ceylon (Suppl.) 6: 115. 1931. *Manzana rosa*; *Pomarrosa*; *Manzana*; *Manzanita*; *Ros* (Cobán, Quechí).

Often abundantly naturalized in forest, pastures, and hedges, especially in Alta Verapaz, Izabal, and along the Pacific *bocacosta*; cultivated commonly at low and middle elevations almost everywhere in Guatemala; native of the Indo-Malaysian region (according to Merrill & Perry, Journ. Arnold Arb. 19: 218. 1938), now pantropic in cultivation and as an escape.

A shrub or small tree, glabrous; leaves lanceolate or elliptic-lanceolate, mostly 3–5 cm. wide, 12–20 cm. long, 4–5 times as long as wide, long-tapering to the narrowly acuminate apex, subcuneate or gradually rounded at the base, the margins shortly decurrent on the stout petiole 1–2 mm. thick, about 1 cm. long; midvein impressed above, prominent beneath; lateral veins 10–15 pairs, slightly elevated both sides but more prominent beneath; marginal vein about equaling the laterals, very slightly arched between them, 2–5 mm. from the margin, with a much fainter nerve very near the margin; upper surface drying pale or dark green, the lower usually greenish brown; glands scarcely apparent on either surface at maturity; inflorescence a terminal raceme up to 2.5 cm. long, the axis 4-angled, stout, 2–3 mm. thick, bearing 2–4 decussate pairs of flowers, the terminal flower usually abortive; flowers large, 7–8 cm. across the stamens; pedicels up to 1.5 cm. long, 1–1.5 mm. thick (2 mm. in fruit); bracts and bracteoles fugacious; hypanthium oboconic, about 1.5 cm. long and 1 cm. across the mouth, gradually narrowed to the base and slightly contracted into a stout, poorly defined pseudostalk 2–3 mm. long;¹ calyx-lobes 4, persistent, concave, reflexed after anthesis, broadly rounded, the larger about 1 cm. wide at base, 6 mm. long; petals white, orbicular, gland-dotted, about 1.5 cm. broad and long; stamens very numerous (about 300) and conspicuous, up to 4 cm. long, creamy-white; anthers oblong, 1.2 mm. long; style 3.5–4 cm. long; fruit broadly depressed-globose, up to 6 cm. in diameter, 3–4 cm. long, rose-scented, pale yellow with pink flush; seed 1, about 2.5 cm. in diameter.

The following notes were supplied by Mr. Standley: Everywhere in Central America the tree is called "Manzana rosa" or "Pomarrosa." It is planted chiefly for ornament and shade, for which it has few superiors in the tropics, the foliage being very dense, dark green, and persistent through the dryest seasons. The flowers are large and rather showy but scarcely pretty. The fruits have a characteristic flavor of rose water, and remind one of toilet soap. Their flavor is little superior to the taste of that article, and the fruits are eaten principally by children, birds, and various domestic animals. The seeds germinate readily, and probably are dispersed by the animals that eat them, for the seedlings often

¹ The majority of species of *Syzygium* have the hypanthium narrowed abruptly or gradually to a slender pedicel-like base which is actually not a pedicel but part of the flower. This is the pseudostalk (cf. Henderson, Gard. Bull. Singapore 12: 12. 1949). When a pedicel is present, the articulation between it and the pseudostalk is evident.

are found in quantity remote from mature trees. The trees have naturalized themselves thoroughly in the wetter parts of Guatemala, particularly about Cobán, where they often look like native trees, especially when scattered through open pine forest. The trees frequently are planted as living fence posts. Sometimes the plant is used for hedges, especially in the coffee regions of the *bocacosta*. If the young plants are pruned severely, they become very dense and form an effective if not particularly handsome hedge. Very infrequently the fruit is stewed and served as a dessert, as we have noted at Quezaltenango and elsewhere. It seldom is offered for sale in the markets. The wood is described as reddish gray, close-grained, and durable. The bark is reported to yield a brown dye, and in some parts of the world is employed for tanning.

Eugenia malaccensis L. Sp. Pl. 470. 1753. *Syzygium malaccense* (L.) Merr. & Perry, Jour. Arnold Arb. 19: 215. 1938.

Planted rarely, especially about Guatemala; doubtless also in the Atlantic lowlands. British Honduras; El Salvador (where called *marañón japonés*); Panama; West Indies; tropical South America; native of some part of the Indo-Malaysian region, now more or less pantropic in cultivation.

A tree 8–20 meters high, glabrous; leaves drooping, coriaceous, usually large, variable in shape and size, from oblong-oblanceolate to oblong-elliptic or somewhat obovate, up to 18 cm. wide, 35–36 cm. long, 1.7–2.7 times as long as wide, the apex abruptly acuminate or obtuse, the base cuneate or somewhat rounded, the margins decurrent on the stout, adaxially flattened or concave petiole 1–1.5 cm. long, 2–3 (–5) mm. thick; midvein impressed above; lateral veins 10–15 pairs, distinctly stronger than any intermediate ones, 1–2.5 cm. apart, diminishing distally, ascending and overarching 0.5–1.5 cm. from the margin and each ultimately joining the next adjacent vein, a definite marginal vein usually not formed as such; blades dark green and somewhat lustrous above; glands obscure on both surfaces; inflorescence a stout axillary raceme formed at leafless nodes below the ends of the branchlets (rarely at leafy nodes), the axis woody, 1–1.5 cm. long, 1.5–3 mm. thick, bearing 2–5 opposite decussate pairs of conspicuously jointed nearly sessile flowers (the pedicels 1–1.5 mm. thick, 1–2 (–8) mm. long); bracts and bracteoles 1–2 mm. long, deciduous before anthesis and leaving prominent narrow scars; buds 1.5–3 cm. long; calyx obconic or funnelform, about 1 cm. across the mouth, abruptly narrowed below into a stout pseudostalk 6–10 mm. long; lobes 4, unequal, persistent, broadly rounded with thin pale margins, at maturity 6–10 (–15) mm. wide, the larger ones 3–6 (–10) mm. long; styles 2.5–3.5 cm. long; stamens about 100; filaments 2–3 cm. long, red, flattened below; anthers 1 mm. long; petals 4, orbicular-spatulate, pink to red, 1–1.5 cm. long; ovary bilocular, multiovulate; fruit oblong or obovoid, 4–7.5 cm. long, 2.5–6 cm. in diameter, pinkish to dark red, umbilicate; seed subglobose, 1.5–2 cm. in diameter, the cotyledons equal or unequal, not fused.

Mr. Standley notes that it is a handsome tree, in appearance much like *E. Jambos*, but the flowers are rose-purple, and produced on thick branches inside the foliage, so they are not visible except when one is under the tree. The fruits are red, pyriform, about 5 cm. long, with an acid and highly agreeable flavor. When in flower this is one of the most delightful of trees, the petals falling in vast numbers and covering the ground with a lovely carpet of bright and handsome color.

Eugenia myrtifolia Sims, Bot. Mag. t. 2230. 1821. ?*E. rheedioides* Standl. & Steyermark. Field Mus. Bot. 23: 131. 1944.

Known in Guatemala from four collections only, all these without special locality and without habitat-data. "Dept. Escuintla," in 1942, Aguilar 1754, 1757 (type of *E. rheedioides*); "Dept. Guatemala," in 1938-39, Aguilar 185, 351.

Tree or shrub, glabrous even to the vegetative buds; leaves elliptic and acute at both ends, varying to oblanceolate or obovate and then often obtuse or rounded at apex; apex often sharply acute or acuminate, or in obtuse leaves shortly cuspidate; margins long-decurrent on the channeled and usually thin-edged petioles 2-5 mm. long; blades 1-2.5 cm. wide, 2-7.5 cm. long, usually 2-3 times as long as wide; midvein sulcate above; lateral veins indefinite, somewhat apparent beneath, rather closely parallel, 10-12 on each side of the midvein; marginal vein about equaling the laterals and sometimes arched between them, up to 1 mm. from the margin; glandular dots scarcely apparent on the leaves; inflorescence terminal, few-flowered, corymbosely cymose, the axis 1-5 cm. long beyond the last pair of foliage leaves, the branches in 2-4 decussate pairs, naked at anthesis or rarely with small leafy bracts, the flowers terminal and solitary or on the most vigorous branches subumbellate in threes on pedicels 1-4 mm. long; buds 6-8.5 mm. long, much wrinkled in drying, the hypanthium long-drawn-out beneath the calyx into an attenuate pseudostalk; calyx-lobes 4, often unequal, rounded-triangular, concave, wrinkled in drying, 1.5-2 mm. long in bud, up to 3 mm. in fruit; disk 3 mm. in diameter, the deeply concave center 1.5 mm. in diameter; style 8-10 mm. long, its base depressed as much as 2 mm. in the concave disk; stamens about 150, the filaments 8-9 mm. long, the anthers 0.5-0.6 mm. long; petals glabrous, ragged-edged, concave, up to 5 mm. long; ovary bilocular, the ovules 6-8 in each locule, radiate in a subcapitate group affixed near the middle of the central dissepiment; fruit not seen.

The type of *E. rheedioides* perhaps belongs to another species, closely allied to the one represented by the other specimens cited above. In the type, Aguilar 1757, the flower-buds are turbinate, 4-5 mm. long, acutely narrowed to the base but lacking the very long attenuate base that marks the other flowering specimens. It is quite clear that the specimens of *E. rheedioides* and the others here referred to *E. myrtifolia* belong to Old World species recently

introduced into Guatemala. No American *Eugenia* known to me has the terminal corymose cyme tending to branch trichotomously. The two flowering specimens of *E. myrtifolia* from Guatemala, Aguilar 185 and 351, match precisely in every particular a specimen of *E. myrtifolia* collected by Adams Jewett in the Jardin des Plantes, Paris, Sep. 4, 1834, a little more than a decade after the introduction of the species from "New Holland." They also appear to match the original illustration in the Botanical Magazine; thus, although I have not seen the type of *E. myrtifolia*, I am confident the name is correctly used for the Guatemala plant. It seems likely that this species has been introduced for ornament, as have so many other Australian Myrtaceae throughout the tropics and subtropics.

Sect. II. EUGENIA.

All native American species as far as known belong to this section. Numerous additional species, thus far unknown from within or near the limits of Guatemala, occur in Mexico. Relatively few others are known from Central America; the number of species known from Guatemala far exceeds that known from any other part of Central America.

Many Guatemalan species are still imperfectly known. Twelve are thus far known from the types only; ten are known in fruit only; and six are known only from flowering specimens. Because of these gaps in our knowledge of these plants, the construction of a satisfactory general key to species is well-nigh impossible. The difficulties are increased by the vegetative uniformity that prevails throughout this genus—and indeed throughout the Myrtaceae—and by the fact that the majority of the species change considerably in appearance, in pubescence and in other characteristics between the time of flowering and that of fruiting.

The following key makes primary use of the various features of the inflorescence, because the structures involved are relatively long-persistent, and because they change little after attaining their full growth. Pubescence-characters are similarly useful except that in mature specimens only small remnants of the original extensive covering may persist. In the interpretation of the key it should be remembered that most of the data, including those relative to such things as color, texture, wrinkling, and appearance of veins and glands, have necessarily been taken from herbarium specimens.

The inflorescence in most American species is a simple leafless raceme bearing a number of opposite decussate pairs of flowers

subtended by small bracts; the raceme in each species is distinctive as to length and as to the number of nodes. In almost all species, however, the raceme may upon occasion be extraordinarily elongated and axillary branches (under the influence of as yet unknown stimuli) may bear flowers in the axils of small bracts at the lower nodes, and flowers in the axils of ordinary leaves at the upper nodes. Persons using the key, therefore, will do well to remember that the same species may appear in several places; an effort has been made to take into account the variation in the most plastic species (e.g. *E. biflora*, *E. Oerstedeana*), but a key to all possible forms of all species would be so cumbersome and equivocal as to defeat its own purpose.

Flowers solitary, axillary, large (disk 5–6 mm. wide; calyx-lobes 4.5–5.5 mm. wide); fruit 1.5 cm. long; plants tomentose; Honduras and Nicaragua.

E. hondurensis.

Flowers racemose, the axis of the raceme often very short and the flowers in approximate pairs, sometimes appearing glomerate or fasciculate. . . . Key A.

- A. Appressed-pubescent or tomentose species with relatively slender and elongate racemes (axis of the racemes mostly 1–3 cm. long, the internodes much longer than the diameter of the axis, and at least some of them 3–5 mm. long or more).

Bracteoles thin and conspicuous, mostly glabrous or nearly so and contrasting with the heavily pubescent hypanthium, persistent in flower and in fruit, 0.7–1.5 mm. long, usually connate along their proximal margins and forming an involucre beneath the flower; plants with copious appressed pubescence of pale sordid hairs.

Bracteoles acute or acuminate, broadly ovate-deltoid, 1–1.5 mm. long; bracts thin, persistent, the upper ones usually longer, often 1–2 mm. long; racemes usually elongate, the axis 1 cm. long or more, with well-separated pairs of flowers; lateral veins close and parallel, 10–20 on each side of the midvein.

Leaves lanceolate, 3–4 times as long as wide, bristle-tipped, impressed-punctate above, the glandular depressions numerous and conspicuous; lowlands, widely distributed on the Atlantic slope. *E. biflora.*

Leaves elliptic to ovate or broadly lanceolate, not bristle-tipped (acuminate but the tip obtuse or sometimes subacute), not at all or sparingly and obscurely impressed-punctate above.

Leaves mostly 3–4 times as long as wide; eastern Mexico to Guatemala.
E. Karwinskyana.

Leaves mostly 1.7–2.5 times as long as wide; Yucatán Peninsula.

E. yucatanensis.

Bracteoles obtusely pointed or rounded, less than 1 mm. long; bracts ovate-deltoid, somewhat indurated at base, less than 1 mm. long; axis of the raceme usually 2–6 mm. long (rarely up to 1 cm.), the pairs of flowers approximate; lateral veins 4–6 (–8) on each side. *E. argyrea.*

Bracteoles not conspicuous, usually pubescent like the hypanthium and pedicel, persistent (and then often somewhat thickened at base), or deciduous at flowering time, not connate and involucre-like even if persistent; plants

with closely appressed or loose pubescence or the hairs all forked or di-brachiate.

Leaves narrowly elliptic-lanceolate, 1.5 cm. wide or less, 3.5–4.5 times as long as wide; known in fruit only, the raceme-axis 1.5 cm. long, bearing 2–3 pairs of flowers; immature fruit oblong-ellipsoid, 12 mm. long; calyx-lobes 2.5 mm. wide; disk 2–2.5 mm. wide.....*E. sasoana*.

Leaves broader, mostly 2–4 (–7) cm. wide, 1.5–3 times as long as wide.

Flowers small; disk in flower mostly 1.3–2 mm. wide; stamens 50–75; larger calyx-lobes 1.5–2.5 mm. wide; axis of the raceme usually less than 1 cm. long; leaves less than 8 cm. long.

Leaves glabrous beneath even at flowering time, elliptic, 2–2.5 times as long as wide, 4–8 cm. long, on petioles 6–9 mm. long; axis of the raceme often 6–10 mm. long; Petén.....*E. Shookii*.

Leaves appressed-pubescent with pale hairs, these often persisting on one or both surfaces until the fruit matures; blades broadly elliptic to ovate or obovate, 1.6–2 (–2.5) times as long as wide, on petioles 4–6 mm. long; axis of the raceme usually less than 5 mm. long; Pacific lowlands, Quezaltenango to western Mexico.....*E. Rekoi*.

Flowers large; disk in flower 2–3 mm. wide or more; stamens 100–200; larger calyx-lobes up to 2.5–4 mm. wide and long; axis of the raceme 1–2.5 (–8) cm. long, seldom shorter; leaves up to 16 cm. long, often shorter, closely appressed-pubescent or tomentose beneath at least at flowering time.

Axis of the raceme 2–5 (–8) cm. long; bracteoles deciduous at flowering time or before.

Pubescence appressed, dull coppery red; leaves acute at the base, at maturity glabrous or sparingly pubescent; disk in flower 2.7–3.3 mm. wide; bracteoles 1.3–1.5 mm. long; lowlands near the Atlantic coast.....*E. aeruginea*.

Pubescence of contorted and often matted hairs, yellowish white to pale reddish brown; leaves rounded and often subauriculate at base, usually permanently pubescent beneath; disk in flower (3–) 4–5 mm. wide; bracteoles 2.5–5 mm. long; middle elevations, Guatemala to Mexico.....*E. salamensis*.

Axis of the raceme usually less than 2 cm. long; bracteoles persistent at least through anthesis; pubescence closely appressed.

Leaves obovate or obovate-elliptic, rounded at apex, permanently silvery-scurfy beneath, the individual hairs so fine as to be scarcely discernible; midvein flat or convex above; axis of the raceme usually less than 1 cm. long.....*E. hypargyreia*.

Leaves mostly elliptic with acuminate tip, glabrescent, at maturity glabrous beneath or with fine scattered pale hairs; midvein impressed above; axis of the raceme usually 1–2 cm. long.

Leaves larger, those on vegetative branchlets 3–6.5 cm. wide, 7–15 cm. long, the smaller leaves often 2.5–3 cm. wide, 6–7.5 cm. long; blades usually broadest at the middle or below, somewhat rounded to the base and gradually narrowed to the tip; Petén; eastern Central America; Lesser Antilles.....*E. octoplea*.

Leaves smaller, those on vegetative branchlets 3–4 cm. wide, 6–9 cm. long, the smaller leaves often 2–2.5 cm. wide, 4.5–6 cm. long; blades mostly broadest near the middle, some of them usually oblanceolate or obovate, with relatively long-drawn-out

- base; mountains of Guatemala, 800–2000 meters, to southeastern Mexico.....*E. guatemalensis*.
- A. Pubescence various or none; racemes short (usually much less than 1 cm.) and the flowers approximate, or if the racemes elongate and slender then the pubescence (if any) mostly of minute upstanding hairs.
- Racemes slender and elongate, 1–2.5 (–4) cm. long; plants glabrous or nearly so at maturity, the branchlets and petioles minutely hispidulous, the tender growth bearing tiny appressed coppery dibrachiate hairs as well, a few of these persisting near the base of the lower leaf-surface.....*E. Oerstediana*.
- Racemes short and crowded, if more than 1 cm. long then with numerous approximate pairs of flowers; flowers often fasciculate or glomerate, sometimes solitary at the lowermost nodes of new leafy branchlets and on the same plants in short racemes.
- Cauliflorous species, the flowers long-pedicellate in clusters at usually leafless nodes on old wood, the axis of the raceme almost none, or 1–3 mm. long; coarse plants with relatively large leaves, flowers and fruits (leaves 7–18 cm. long; disk 2.5–6 mm. wide; pedicels 8–30 mm. long; fruit 1.5–2.5 cm. long).
- Leaves cordate-auriculate at base; petioles (3–) 4.5–7 mm. long; inflorescence hirsutulous.....*E. jutiapensis*.
- Leaves acute to cuneate at base, or somewhat rounded to a cuneate-decurrent base, never cordate-auriculate; inflorescence glabrous or sparingly ciliate.
- Young branchlets and herbage densely brown-tomentose; leaves dotted beneath with abundant small convex resinous glands; midvein impressed above; bracteoles connate, forming a persistent involucre 2–2.2 mm. wide.....*E. chiapensis*.
- Plants glabrous or essentially so as far as known; leaves not much dotted beneath; midvein flat or concave above; bracteoles distinct but persistent, 1–1.5 mm. long.
- Lateral veins about 6–8 on each side, strongly ascending and anastomosing, scarcely forming a marginal vein; leaf 7–8 cm. wide; pedicels in fruit 13–30 mm. long; disk 6 mm. wide; larger calyx-lobes 4 mm. long, 5–6 mm. wide in fruit (flowers unknown); fruit 1.5–2 cm. thick, 2–2.2 cm. long.....*E. Matudae*.
- Lateral veins about 10–12, nearly straight, connected by a series of arches forming a marginal vein 3–5 mm. from the margin; leaf 2.5–6 (–8) cm. wide; pedicels in fruit 8–12 mm. long; disk 3.5–4 mm. wide; larger calyx-lobes 2.5 mm. long, 3–3.5 mm. wide; fruit 1–1.5 cm. thick, 1.5–2.3 cm. long.....*E. choapamensis*.
- Species not cauliflorous, the inflorescences usually in the axils of new leaves, if occasionally at leafless nodes then the raceme-axis prolonged or the pedicels very short, or both; plants and flowers various.....Key B.
- B. Inflorescence (at the time of anthesis) or developing leafy branchlets, or usually both, tomentose (the hairs matted or contorted) or appressed-pubescent; minute erect hairs if present sparse, or often obscured by the appressed hairs; some or all the hairs often forked or dibrachiate. [Plants often glabrous or nearly so by the time the fruit matures, a few of the characteristic hairs usually persisting about nodes and in the inflorescence.] (See second "B," p. 322.)
- Flowers large and tomentose, mostly few in close axillary clusters [calyx-lobes 4–8 mm. long and wide; disk 3.5–5.5 mm. wide; axis of the raceme none or scarcely apparent, 5 mm. long or less, 1–2 mm. thick; pedicels 0–3 (–5) mm. long].

- Midvein of leaves convex above; known in fruit only, the fruit about 2 cm. long; pedicels 2–2.5 mm. long and thick; disk 5.5 mm. wide; tomentum pale brown; axis of raceme almost none. *E. toledinensis*.
- Midvein impressed above, often sharply and narrowly so; tomentum bright red or coppery or silvery brown.
- Leaves (3–) 4 times as long as wide, 9–20 cm. long, with caudate-acuminate tip 1–2 cm. long; petioles 6–8 mm. long; bracteoles persistent, forming a tomentulose involucre beneath the fruit; flowers unknown; fruit nearly sessile, its disk 3.5–4.5 mm. wide; tomentum pale coppery to "silvery brown" or "buff brown," persistent on the lower leaf-surface. *E. cervina*.
- Leaves 2–2.7 times as long as wide, 5–12 cm. long, broadly short-acuminate; petioles 10–15 mm. long; bracteoles deciduous at anthesis, 2–5 mm. long; tomentum bright red or coppery.
- Flowers very large and almost sessile (disk 5 mm. wide; style 12 mm. long; calyx-lobes 6–8 mm. long and wide); fruit 2–3 cm. long, tomentose; surfaces of racemes and young growth densely tomentose, the mat of contorted hairs up to 1 mm. thick. *E. pachychlamys*.
- Flowers moderately large, on pedicels 3–5 mm. long (disk 3.5–4 mm. wide; style 8 mm. long; calyx-lobes 4–4.5 mm. long and wide); fruit unknown; branchlets and inflorescence more loosely and thinly tomentose. *E. savannarum*.
- Flowers neither large nor tomentose, the hairs if abundant and only loosely appressed then mostly longitudinally oriented on the branchlets and racemes; calyx-lobes at most 3.5–4 mm. long and wide, usually much less; disk at most 3.5 mm. wide, usually much less; axis of the raceme often well developed, the flowers then evidently racemose.
- Hairs of the branchlets and pedicels mostly or partly appressed and dibrachiate, one branch of the hairs often considerably longer than the other; bracteoles and calyx-lobes usually pubescent to about the same extent as the hypanthium.
- Flowers glabrous or nearly so (the bracteoles and perianth-segments often ciliate); young branchlets sparingly or rather densely pubescent with small evanescent partly dibrachiate hairs, the plants as a whole soon glabrate.
- Pedicels (3–) 6–10 (–25) mm. long; flowers up to 5–6 pairs in slender axillary racemes, or solitary in some axils; fruit 8–10 mm. in diameter. *E. Oerstedeana*.
- Flowers sessile, as many as 50 or more in dense glomerules; fruit 2.7–3.3 cm. in diameter, 3–3.5 cm. long. *E. citrodes*.
- Flowers and pedicels appressed-pubescent, usually densely so, like the young leafy branchlets and the rest of the inflorescence, with reddish, sordid or yellow-white hairs; hairs more or less persistent, the plants eventually glabrate.
- Flowers small; disk in flower mostly 1.3–2 mm. wide; stamens 50–75 (–100); larger calyx-lobes 1.5–2.5 mm. wide; axis of the raceme usually less than 1 cm. long; leaves 8 cm. long or less.
- Leaves glabrous beneath even at flowering time; lowlands of the Atlantic slope.
- Leaves caudate-acuminate, the slender obtuse apex 7–12 mm. long, or shorter in small leaves; pedicels and buds including the calyx

subtomentose, the pubescence copious; bracteoles 1–1.5 mm. long; branchlets often hispidulous after the appressed hairs fall.

E. bumelioides.

Leaves abruptly or gradually acuminate, or obtuse or rounded, if acuminate the tip shorter than above; calyx-lobes glabrous or merely strigose except near the tips; bracteoles 1 mm. long or less.

Flowers glomerate, the axis of the raceme usually 1–3 mm. long; leaves often obtuse, sometimes acuminate; hairs pale, yellow-white to pale reddish; hypanthium little elongated after anthesis, the fruit globose or nearly so. *E. laevis.*

Flowers definitely racemosous, the axis often 6–11 mm. long; leaves obtusely but often slenderly acuminate; hairs coppery brown; hypanthium soon elongate, the fruit oblong or ellipsoid.

E. Shookii.

Leaves appressed-pubescent beneath with pale hairs, these often persisting on one or both surfaces until the fruit matures; axis of the raceme usually less than 5 mm. long; Pacific lowlands, Quezalteango to western Mexico. *E. Rekoi.*

Flowers larger; disk in flower 2–3 mm. wide or more; stamens 100–200; larger calyx-lobes up to 2.5–4 mm. wide; axis of the raceme often 1–2 cm. long; leaves up to 16 cm. long, often shorter, closely appressed-pubescent or tomentose beneath at least at flowering time [*E. hypargyrea*, *E. guatemalensis*, *E. octopleura*]. (See key above, p. 317).

Hairs of the branchlets and pedicels simple, appressed or sometimes in part contorted or spreading-ascending; hypanthium often heavily pubescent and often contrasting with the more nearly glabrous bracteoles and calyx-lobes.

Bracteoles acute or acuminate, thin and conspicuous, 1–1.5 mm. long, broadly ovate-deltoid, glabrous or nearly so and contrasting with the heavily pubescent, canescent hypanthium, mostly connate along the proximal margins and forming an involucre beneath the pedicellate flower; bracts persistent, the upper ones thinner and elongate, 1–2.5 mm. long.

Midvein concave or broadly sulcate above, glabrous or at first with a few long hairs; leaves elliptic or ovate, about twice as long as wide, obtusely acuminate; axis of the raceme very short, usually less than 5 mm. long; Petén, British Honduras. *E. Trikii.*

Midvein sharply and narrowly impressed above, the furrow usually persistently hispidulous; axis of some or all the racemes usually 1 cm. long or more [*E. biflora*, *E. Karwinskyana*, *E. yucatanensis*]. (See key above, p. 316.)

Bracteoles obtuse or rounded, mostly inconspicuous and less than 1 mm. long; hypanthium (except in two species) not canescent or strongly colored by the pubescence; bracts mostly 1 mm. long or less; flowers approximate, the internodes of the rachis usually less than 1.5 mm. long; axis of the raceme usually 3–6 mm. long or less.

Hypanthium densely appressed-pubescent, whitened or colored by the pubescence.

Flowers pedicellate; inflorescence and young growth densely clothed with closely appressed lustrous coppery or golden silky hairs;

- bracteoles and calyx-lobes nearly glabrous, contrasting with the pubescent hypanthium..... *E. argyrea*.
- Flowers sessile; inflorescence and young growth rather sparingly appressed-pubescent with stiff pale hairs; calyx-lobes silky-strigose, scarcely less pubescent than the hypanthium . . . *E. amatenangensis*.
- Hypanthium sparingly pubescent or glabrous, the bracteoles and calyx similarly pubescent; inflorescence and young growth with some appressed, ascending or flexuous hairs, often also with numerous small erect hairs. [Here are to be found notably pubescent individuals of species that will ordinarily be located in Key C on p. 324.]
- Flowers sessile and glomerate, 2–3 pairs, the raceme-axis 1 mm. long; bracteoles broad and membranous, suborbicular or broadly deltoid-ovate, connate and persistent; pubescence of short appressed reddish hairs; Petén..... *E. vesca*.
- Flowers evidently pedicellate, the pedicels sometimes only 1–2 mm. long; axis of the raceme usually 3–6 mm. long.
- Young branchlets and inflorescence more or less persistently hispidulous, sometimes also with some appressed or silky hairs in the inflorescence; lowlands, chiefly of the Atlantic slope.
- Silky hairs in the inflorescence and on the flowers abundant, up to 0.5 mm. long, yellowish-brown or coppery, soon falling, the branchlets strongly and permanently hispidulous; fruit 7–8 mm. in diameter, usually broadly short-stipitate; bracteoles distinct, persistent and hairy beneath the fruit, 0.5–0.8 mm. long..... *E. vacana*.
- Flowers glabrous or somewhat hispidulous; inflorescence hispidulous, glabrous, or with some short appressed hairs on the raceme; fruit as far as known not stipitate; bracteoles distinct or connate, glabrous or minutely hispidulous.
- Bracteoles persistent but not connate, broadly deltoid-ovate, 0.5 mm. long; racemes and branchlets rather coarsely setose-pubescent, the sordid hairs 0.2–0.5 mm. long; racemes well developed, the axis often 5–12 mm. long with 4–8 well-separated pairs of flowers; leaves when dry opaque, the veins scarcely apparent on the upper surface, the midveins sulcate..... *E. flavoviridis*.
- Bracteoles usually united by the proximal margins and forming an involucle beneath the flower; plants mostly glabrous or minutely hispidulous; axis of the raceme 3–6 mm. long, or if longer then the flowers more numerous, and approximate.
- Leaves ovate or rhombic-ovate to elliptic, 3–6.5 cm. long, opaque, the veins scarcely evident above in dried leaves; petioles ventrally flat or concave, dilated into the base of the blade; pedicels in flower 3 mm. long or less; buds 1.5–2.7 mm. long; disk 1 mm. wide; style 3–4.5 mm. long; fruit 7–8 mm. in diameter; plants usually glabrous.
- E. axillaris*.
- Leaves elliptic or obovate, occasionally ovate, 6–12 cm. long, veiny, the lateral and marginal veins pale above in dried leaves and contrasting with the darker mesophyll; petioles deeply channeled, usually with an abrupt transition into the blade; midvein often flat and wrinkled near the

base, often somewhat depressed below the surface of the blade, for most of its length often narrowly sulcate between two low parallel convex ridges; pedicels (at least the lower) 5–13 mm. long; buds 2.5–4 mm. long; disk 1.3–2 mm. wide; style (5–) 7–8 mm. long; fruit 1 cm. or more in diameter; plants often hispidulous.

E. acapulcensis.

Young branchlets and inflorescence not hispidulous, but more or less appressed-pubescent with coarse coppery hairs up to 0.5 mm. long or more, the whole plant soon glabrate; leaves elliptic, acuminate; pedicels 1.5–2 mm. long; mountains of Chiapas.

E. nigrita.

- B. Plants glabrous, hispidulous, hirsute or setose, the hairs mostly erect, sometimes very short; appressed hairs, if present, comparatively few; dibrachiate (appressed) hairs present in 4 species [included in this part of the key because mature plants may be quite glabrous, or merely hispidulous].

Plants nearly glabrous, or hispidulous, the young growth bearing small coppery appressed dibrachiate hairs, a few of these hairs persisting on the lower leaf-surface and the midvein near the base; at least some of the flowers in slender elongated racemes 1–2.5 (–4) cm. long; bracteoles broad, membranous, persistent, up to 1.5 mm. long and wide.....*E. Oerstedeana*.

Plants various; dibrachiate hairs if present conspicuous and abundant on the pedicels at least at flowering time.

Plants hairy or setose, the erect stiff hairs often 0.5–1 mm. long or more, densely and permanently covering the branchlets, petioles, racemes and at least the veins of the lower leaf-surfaces.

Leaves large (blades mostly 7–19 cm. long, petioles 7–15 mm. long, 1.5–2.5 mm. thick including the hairs); fruit 1–2 cm. in diameter; larger calyx-lobes 2.5–4 mm. wide; flowers sessile or nearly so, glomerate.

Midvein flat or convex above; blades 12–19 cm. long; lateral veins arcuate-ascending, 8–10 on each side, scarcely forming a marginal vein, each recurving 5–7 mm. from the margin to join the next succeeding one; flowers unknown; immature fruit 1.3 cm. long, its disk 2.5 mm. wide.....*E. lancetillae*.

Midvein concave and somewhat impressed above; lateral veins not strongly arcuate, the marginal vein well developed, about as strong as the lateral ones and arched between them, 2–4 mm. from the margin.

Leaves 2–4 (–6) cm. wide, acute or cuneate at base; plants densely tawny-hirsutulous; bracteoles oblong, 1.5–1.7 mm. long, 0.7 mm. wide; fruit 1.3–1.5 cm. long.....*E. Yunckeri*.

Leaves 6–8 cm. wide, rounded at base, the margins abruptly decurrent on the sparingly hispid petiole; plants soon glabrate, known only in fruit; bracteoles broadly rounded, 1 mm. long, 2 mm. wide; fruit 2 cm. long or more.....*E. papalensis*.

Leaves small (blades 10 cm. long or less; petioles 4 mm. long or less); fruit 5–8 mm. in diameter; larger calyx-lobes 1–2 mm. long and wide.

Plants uniformly and coarsely but not very densely setose, the reddish or tawny hairs in no way obscuring the surface of the branchlets or the lower leaf-surface; setae on the midvein near the base of the lower leaf-surface 1–1.3 mm. long; cilia of the calyx-lobes 0.5–0.7 mm. long; flowers sessile, glomerate; leaves oblong-elliptic, abruptly

rounded to a subcordate base, the margins seeming to meet across the flat summit of the petiole.....*E. chinajensis*.

Plants finely and often densely soft-hirsutulous, the pale hairs often very numerous and covering the branchlets and principal veins and petioles; hairs of the midvein near the base of the lower leaf-surface 0.5 (-0.8) mm. long; cilia of the calyx-lobes mostly 0.2-0.4 mm. long or less; leaves (rarely subcordate in *E. origanoides*) cuneate to acute or somewhat rounded at base.

Flowers closely glomerate, the racemes several, clustered, setose or hairy, the pedicels and the axis of the raceme usually concealed by the flowers; calyx-lobes 1-2 mm. long and wide; style 5.5-7 mm. long; leaves mostly elliptic, 4-10 cm. long, the midvein impressed above.....*E. origanoides*.

Flowers evidently racemose, the slender raceme-axis 1-6 mm. long, bearing 2-5 pairs of flowers on pedicels 1-2 mm. long; racemes puberulent or minutely hispidulous, the hairs and flowers not concealing the racemes; calyx-lobes 1 mm. long and wide, or less; leaves 2.5-5.5 cm. long, the midvein flat or convex above.

Leaves elliptic, bluntly acuminate; marginal vein evident; flowers and mature fruit unknown.....*E. rufidula*.

Leaves obovate or elliptic, mostly rounded at apex; lateral veins arcuate-ascending, a well-defined marginal vein not formed; style 3.5 mm. long; fruit 5 mm. in diameter.....*E. buxifolia*.

Plants glabrous, puberulent or minutely hispidulous, the hairs 0.1-0.3 mm. long, often incurved. [Bracts and flower-parts sometimes long-ciliate, or branchlets with slightly longer hairs, but then the leaves glabrous or nearly so.]

Hypanthium prominently 8-ridged, the ridges usually apparent at anthesis, becoming broad and fleshy in fruit, sometimes as high as the thickness of the body of the fruit.

Flowers sessile or essentially so, glomerate in the axils of leaves; hypanthium from the very earliest stages nearly globose and strongly ridged, abruptly expanded above a narrow neck into the large erect subfoliaceous calyx; mature calyx-lobes up to 4 mm. long and wide; disk 3.5 mm. wide; flowers and mature fruit unknown; native species.
E. cacuminum.

Flowers on slender pedicels (5-) 10-18 mm. long, these usually subtended by thin scarious or colored bracts 3-5 mm. long; hypanthium at first campanulate, the ridges soon apparent at least just beneath the calyx; calyx-lobes elongate, strongly reflexed at anthesis; disk 2 mm. wide; cultivated, native of South America.....*E. uniflora*.

Hypanthium not prominently ridged, usually campanulate; fruit not ridged.

Flowers sessile and glomerate; pedicels up to 1-1.5 mm. long in fruit; axis of the raceme or racemes hardly developed, or 1-3 mm. long, stout, hidden among the flowers and scarcely apparent; flowers glabrous, or some parts ciliate.

Leaves small and prevailingly obovate, coriaceous, 3-6 cm. long, blunt-tipped or rounded at apex; midvein flat to convex above; petioles 2-4 mm. long; fruit 6-10 mm. in diameter; plants glabrous; Petén and British Honduras.....*E. Ibarrae*.

Leaves larger and prevailingly elliptic or ovate, sometimes obovate, thinner, mostly 6–13 cm. long, acuminate or subacuminate or sometimes obtuse; midvein channeled or narrowly impressed above; petioles 4–10 mm. long; young shoots tomentose or strigose.

Petén; fruit 5–7 mm. in diameter; young shoots probably reddish-strigose with simple hairs; midvein narrowly channeled, often bordered by parallel convex ridges; bracteoles broad and membranous, connate, 1–1.3 mm. wide. *E. vesca*.

Wet mountains above 2000 meters, Chiapas and Guatemala; fruit 2.7–3.3 cm. in diameter; young shoots tomentose, some of the hairs dibrachiate; midvein narrowly impressed above; bracteoles ovate, pointed, scarcely connate, 0.7 mm. wide.

E. citroides.

Flowers definitely pedicellate (the pedicels sometimes only 1–2 mm. long at flowering time); axis of the raceme usually slender and evident, but sometimes very short. Key C.

C. Flowers large [larger calyx-lobes 2.5–3.5 mm. wide; disk (1.5–) 2–3.5 mm. wide]; axis of the raceme not much elongating (1–4 mm. long); pedicels except in one species 6–20 mm. long.

Pedicels short and stout (1–2 mm. long, at anthesis 0.5 mm. thick or more); leaf-blades 8–13 cm. long, the petioles 8–10 mm. long; inflorescence, including the flowers, minutely puberulent. *E. Percivalii*.

Pedicels usually 6–10 mm. long or more; inflorescence glabrous except that the bracts and perianth-parts may be ciliate.

Leaves rounded-obovate to oblong-elliptic, 4–10 cm. long, broadly rounded or obtuse at apex; petioles 2–4 mm. long, up to 2.5 mm. thick; midvein prominently convex above, often nearly 1 mm. wide near base.

E. Winzerlingii.

Leaves ovate to elliptic-lanceolate, 2–6 cm. long, narrowly but obtusely pointed or acuminate; petioles 1.5–7 mm. long, 0.7–1.2 mm. thick; midvein shallowly sulcate at least toward the base of the blade, or flat, never broad and convex. *E. rhombea*.

C. Flowers small [larger calyx-lobes 2 mm. wide or less; disk 1–2 mm. wide]; axis of the raceme often slender and evident, 3–5 (–10) mm. long; pedicels mostly 5 mm. long or less, occasionally longer; young branchlets or inflorescences, or both, often puberulent or hispidulous.

Pedicels very slender, (–5) 10–18 mm. long, usually subtended by thin scarious or colored bracts 3–5 mm. long; bracteoles thin, deciduous before anthesis; flowers few (1–6), solitary or seeming to arise from an involucre of bracts; plants glabrous; developing ovary becoming 8-ridged. *E. uniflora*.

Pedicels (at least most of them) 5 mm. long or less, subtended by indurated or merely thin-tipped bracts 0.5–1 (–1.5) mm. long; bracteoles persistent, usually until the fruit falls, often partly connate by the proximal margins; branchlets and inflorescence usually hispidulous.

Plants glabrous (at least not hispidulous or puberulent, sometimes with a few long or appressed hairs, the bracts and calyx-lobes often ciliate).

Bracteoles more or less connate and involucre-like beneath the flower; lowlands mostly of the Atlantic slope [*E. acapulcensis*, *E. axillaris*]. (See key above, p. 321.)

Bracteoles persistent, but distinct on the two sides of the hypanthium, their proximal margins not or barely contiguous; mountains of Chiapas and central Guatemala, one species in Tabasco.

- Midvein sharply impressed; leaves rather broadly elliptic or elliptic-ovate, 2-2.3 times as long as wide; young herbage and inflorescence with scattered coppery hairs; bracteoles obtusely pointed, divaricate, 1 mm. long.....*E. nigrata*.
- Midvein flat or convex above, or shallowly channeled between low parallel ridges; leaves narrowly elliptic to lance-ovate, 2.5-4 times as long as wide; plants essentially glabrous; bracteoles rounded or truncate, 0.5 mm. long.
- Leaf-bases mostly cuneate, the lowest 1-2 pairs of lateral veins leaving the midvein at a narrow angle and ascending more or less parallel to the margin; racemes proliferous, the flowers often 2-3 in the axil of a bract.....*E. capulivoides*.
- Leaf-bases rounded to acute, the lowermost lateral veins divergent, not noticeably more strongly ascending than the others; bracts each subtending a single flower.....*E. balancanensis*.
- Plants hispidulous or puberulent, the branchlets, petioles, inflorescences and often leaves bearing numerous erect, ascending or incurved hairs 0.1-0.3 mm. long.
- Bracteoles connate and involucre-like beneath the flower; leaves 5-10 cm. long, 2-6 cm. wide, thick and coriaceous but veiny, the lateral veins in dried leaves usually pale and convex above; midvein usually depressed beneath the general surface of the blade, itself sometimes nearly flat, or sulcate, or even convex; axis of the raceme often 6-10 mm. long or even more.
- Leaves drying yellow-green or yellow; midvein convex near the middle of the blade on the upper surface, varying especially toward the base of the blade to flat or even sulcate; hypanthium densely and very minutely pubescent with pale appressed hairs smaller than those of the pedicels, closely invested and partly covered by the bracteoles; calyx-lobes finely puberulent on both sides; fruit transversely oval, 7-8 mm. wide in the longer axis, 5-6 mm. long.....*E. farameoides*.
- Leaves drying brownish red, reddish, green or brownish green; midvein usually sulcate between narrow parallel ridges, often flat and somewhat wrinkled near the base in dried leaves; hypanthium usually glabrous, sometimes hispidulous like the pedicels, mostly or wholly exserted beyond the bracteoles; calyx-lobes usually glabrous; fruit globose, 1 cm. or more in diameter.....*E. acapulcensis*.
- Bracteoles persistent, but distinct on the two sides of the hypanthium, their proximal margins not or scarcely contiguous.....Key D.
- D. Leaves flat in drying, the midvein not depressed beneath the general level of the blade, the vein itself flat or slightly elevated on the upper surface, sometimes shallowly channeled especially near the base; leaves often opaque and relatively featureless above, the veins then scarcely or not at all apparent.
- Leaves mostly rounded at apex, obovate to elliptic, widest at or above the middle, cuneate at base, the petioles 1.5-3 mm. long.....*E. buxifolia*.
- Leaves acute or acuminate, elliptic or ovate to lanceolate, widest at or below the middle.
- Upper leaf-surface uniformly puberulent even in age, with minute curved hairs 0.1 mm. long; petioles 2-2.5 mm. long; axis of the raceme usually well developed, often 8-12 mm. long.....*E. riograndis*.
- Upper leaf-surface glabrous at maturity, or pubescent along the midvein, at most sparingly puberulent elsewhere.

- Midvein (known in immature leaves only) channeled in the nearly plane surface of the blade, the narrow channel bordered by low parallel ridges; buds 3.5 mm. long, the hypanthium substipitate; mountains of Chiapas..... *E. ovandensis*.
- Midvein flat, or somewhat convex or elevated above; buds 2–2.5 mm. long, the hypanthium closely invested by the bracteoles; low elevations, mostly on the Atlantic slope.
- Fruit (7–) 9–12 mm. in diameter; fruiting pedicels 0.4–0.6 mm. thick; flowers usually evidently racemose, the axis of the longer racemes on each plant 6–10 (–25) mm. long; calyx-lobes appearing about as long as wide, the larger ones about 1.5 mm. wide..... *E. tikalana*.
- Fruit 4–6 mm. in diameter; fruiting pedicels 0.3 mm. thick; flowers usually in nearly sessile sub-umbellate clusters, the axis of the longer racemes on each plant 4–5 mm. long or less; calyx-lobes often appearing shorter than wide, the larger ones 1 mm. wide or less. *E. Capuli*.
- D. Leaves in drying downwardly curved toward the midline, the midvein depressed below the general level of the upper surface of the blade, often very narrow and appearing as if in a V-shaped furrow; lateral veins various.
- Midvein (known in immature leaves only) channeled in the nearly plane surface of the blade, the narrow channel bordered by low parallel ridges of vascular tissue; buds 3.5 mm. long, like the pedicels finely hispidulous, the hypanthium substipitate; mountains of Chiapas..... *E. ovandensis*.
- Midvein impressed in a narrow V-shaped furrow, or the furrow more open and the vein apparent as a concave and often pale line; parallel vein-like ridges not developed along the midvein, the laminar tissue descending smoothly toward the furrow; hypanthium as far as known not stipitate; buds, if as much as 3.5 mm. long, appressed-pubescent like the pedicels.
- Leaves narrowly elliptic, bluntly acuminate, acute or cuneate at base, 2 cm. wide or less, 2.5–3.5 times as long as wide; axis of the racemes (known in flower only) 4–9 mm. long; inflorescence minutely puberulent; pedicels 1–1.5 mm. long; mountains of Chiapas..... *E. letreroana*.
- Leaves usually broader, (1–) 2–5 cm. wide, 1.5–3 times as long as wide; racemes and branchlets hispidulous or appressed-pubescent; lowlands, Yucatán to eastern Guatemala and Honduras.
- Leaves mostly of an oblong-elliptic type, 6–9 cm. long, acuminate, rather rigidly coriaceous, drying very smooth above and often yellowish green, concolorous, or darker beneath; midvein rather broadly sulcate; racemes in young fruit (flowers and mature fruits unknown) well developed and rather loosely flowered, the sparingly and rather coarsely setose-pubescent axis mostly 5–12 mm. long; pedicels 1.5–4 mm. long, similarly pubescent..... *E. flavorividis*.
- Leaves ovate to elliptic or obovate, varying to lanceolate or oblanceolate, not especially smooth above when dry, the surface microscopically roughened by very numerous small pale convex dots much smaller than the foliar glands; blades often much darkening above in drying, paler beneath; midvein usually narrowly impressed in a V-shaped furrow; raceme-axis 3–5 mm. long or less; pedicels and racemes appressed-pubescent or loosely pilose at flowering time.
- Branchlets at maturity smooth or essentially so, when young appressed-pubescent, the pubescence including numerous dibrachiate hairs; pedicels at flowering time densely appressed-pubescent with dibrachiate hairs.

- Leaves caudate-acuminate, the slender obtuse apex 7–12 mm. long, or shorter in some small leaves, the blades rather broadly elliptic-ovate or obovate; calyx-lobes in flower densely pubescent on both sides; fruit 10–12 mm. in diameter, sessile..... *E. bumelioides*.
- Leaves if acuminate shortly and broadly so, often obtusely pointed or rounded at the tip; blades elliptic to lance-ovate, or in Guatemala mostly oblanceolate to obovate; calyx-lobes in flower rather densely pubescent near the tips, otherwise merely strigose without, and glabrous within; fruit 5–8 mm. in diameter, in one variety stipitate..... *E. laevis*.
- Branchlets rather persistently hispidulous with small erect stiff hairs, when young shaggy-pubescent also with some long weak ascending hairs, the hairs all or nearly all simple, including the contorted silky ones of the pedicels and hypanthium; leaves elliptic, obscurely or shortly and broadly acuminate, the tip seldom narrow and elongate; calyx-lobes glabrous within; fruit 7–8 mm. in diameter, often broadly short-stipitate..... *E. vacana*.

Eugenia acapulcensis Steud. Nom. ed. 2. 1: 601. 1840. *Myrtus maritima* HBK. Nov. Gen. & Sp. 6: 146 [folio ed. 116]. 1823. *Eugenia maritima* (HBK.) DC. Prodr. 3: 282. 1828, not *E. maritima* DC. l.c. 271. ?*E. Bonplandiana* Berg, Linnaea 27: 228. 1856 (type from Colombia, Humboldt & Bonpland). *E. mosquitensis* Berg, Linnaea 31: 257. 1862 (type from Pearl Key Lagoon, Nicaragua, Wullschlägel). *E. deltoidea* Standl. Contr. U. S. Nat. Herb. 23: 1045. 1924 (type from Guerrero, Nelson 2292). *E. antiquae* Riley, Kew Bull. 1927: 121. 1927 (type from Panama, Riley 142). *E. escuintlensis* Lundell, Phytologia 2: 4. 1941 (type from Chiapas, Matuda 4144). *E. ovatifolia* Lundell, Bull. Torrey Club 69: 396. 1 Mai 1942 (type from British Honduras, P. H. Gentle 30). *E. Bartlettiana* Lundell, Contr. Univ. Mich. Herb. 7: 30. Mai 1942 (type from British Honduras, Gentle 47). *E. bracteolosa* Lundell, l.c. 31 (type from British Honduras, C. L. Lundell 4316). *E. campechiana* Lundell, l.c. 32 (type from Campeche, E. Matuda 3832). *E. sibunensis* Lundell, l.c. 34 (type from British Honduras, Gentle 1619). *E. comitanensis* Lundell, Wrightia 3: 12. 1961 (type from Chiapas, E. Matuda 5753).

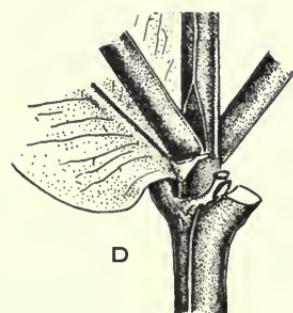
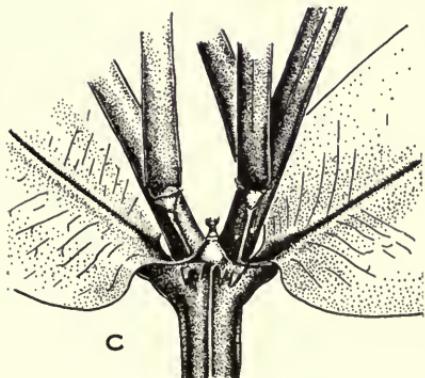
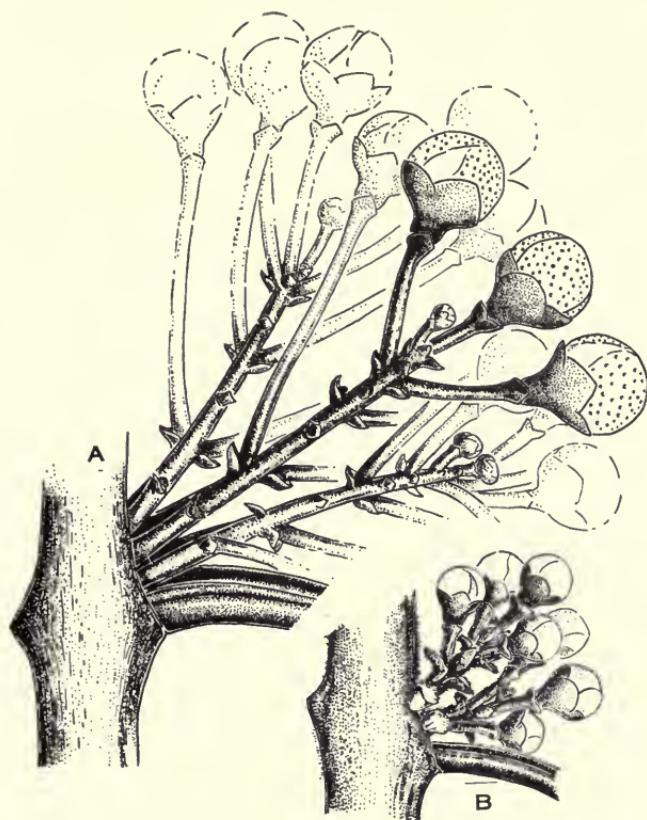
Moist or wet thickets or forest, mostly in the Atlantic lowlands, 300 meters or less; Petén; Escuintla; Retalhuleu. Mexico (Tabasco and Chiapas to Sinaloa, the type from Acapulco, Bonpland; Yucatán Peninsula (Campeche, British Honduras); Honduras; Nicaragua; Panama; northern Colombia; West Indies.

A tree mostly 5–10 meters high, up to 30 cm. in diameter, either quite glabrous, or the branchlets, petioles and inflorescence (usually) minutely hispidulous, the bracts and the raceme-axis also thickly pubescent with crisped small golden hairs; leaves generally elliptic, varying to obovate or rarely to ovate, (2–) 3–4

(-6) cm. wide, (6-) 8-12 cm. long, 2-3 (-3.5) times as long as wide, abruptly short-acuminate or sometimes slenderly acuminate, or some or all the leaves obtuse; blades acute or cuneate at base, or sometimes rounded in the broader leaves on the same plants, the margins decurrent on the inner angles of the rather deeply channeled petioles 5-8 (-12) mm. long, up to 1-1.5 (-2) mm. thick; midvein often rather flat and somewhat wrinkled near base in drying, often somewhat depressed below the surface of the blade and near the middle of the blade or below usually narrowly sulcate between two convex ridges; lateral veins 6-10 on each side, straight, passing directly into an arched marginal vein of about the same thickness, or individual veins arching over and joining the next succeeding ones but scarcely diminished distally; marginal veins often well separated (1-5 mm.) from the margin, with small submarginal veins intervening; lateral and marginal veins convex on both surfaces, pale above and contrasting with the darker mesophyll; blades darker and somewhat lustrous above, paler and often drying brown beneath; glands often apparent on both surfaces, or seen merely as dark dots beneath; inflorescences racemose, stout and short, proliferous, the racemes usually 2 or 3 superposed in each axil, occasionally compound, or the lower nodes of individual racemes bearing 2-3 flowers each; racemes 3-6 (-17) mm. long, crowded, bearing 3-6 (-15) opposite or subopposite, decussate pairs of flowers; axis of the raceme angled and dorsi-ventrally compressed, 1.5-2 mm. wide at base, rapidly diminishing distally; lower pedicels 5-9 (-13) mm. long, the upper (or sometimes all) 3-5 mm. long; bracts scarious, persistent, ovate, acute or obtuse, up to 1.4 mm. long; bracteoles variable in size from plant to plant, ciliate but otherwise usually glabrous, 0.5-1.5 mm. long and wide, connate by the proximal margins into a persistent cuplike involucre partially concealing the usually glabrous cup-shaped hypanthium; surface of the hypanthium, if minutely puberulent like the pedicel, not obscured by the tiny erect hairs; buds pyriform, 2.5-4 mm. long, the globe of the petals 2-2.5 mm. in diameter; calyx-lobes broadly rounded, usually glabrous, 1-1.5 mm. long and wide; disk 1.3-2 mm. wide, nearly glabrous or the staminal ring hairy; stamens about (60-) 100, up to 7 mm. long; style (5-) 7-8 mm. long; petals ciliate, conspicuously dotted with large dark glands evident even in the bud, 3-4 mm. long; ovary bilocular, the ovules 6-15 in a centrally attached sub-capitate group in each locule; fruit globose, black, somewhat fleshy, 1 (-2?) cm. in diameter.

For notes on the taxonomy and nomenclature of this variable species, see *Fieldiana, Bot.* 29: 421-425. 1963.

FIG. 50. Inflorescences in Myrtaceae. A, Racemose type, *Eugenia acapulcensis* (primarily from Matuda 3194); $\times 4$. B, Racemose type, *E. axillaris* (Steere 2640, type of *E. cozumelensis*); $\times 4$. C, D, Forked branching at the terminal node, *Calyptranthes Karlingii* (Matuda 3717); $\times 2$. In *Calyptranthes* the smaller branches are often forked and divaricate, two axillary branches developing at the terminal node but the terminal bud aborting. The "paired panicles" (fig. 49, E) are ordinarily produced at the lowermost node of such an axillary branch, which may produce leaves at the upper nodes. In D, the terminal bud and one axillary branch have failed to develop; the left-hand axillary branch now falsely appears to be terminal, having pushed aside in its growth the undeveloped remnants of the buds.



Eugenia aeruginea DC. Prodr. 3: 283. 1828. *E. Fadyenii* Krug & Urb. ex Urb. Bot. Jahrb. 19: 622. 1895.

Wet mixed forest, often in mangrove swamps or along banks of streams near the coast, at or little above sea level; Petén; Izabal (Puerto Barrios, W. R. Hatch & C. L. Wilson). Campeche; British Honduras; El Salvador; Jamaica and Cuba.

A tree up to 10–15 meters in height and to 60 cm. in diameter, glabrate, the inflorescence and young growth appressed-pubescent with coppery dibrachiate hairs (persistent hairs on the petioles and leaf-surfaces mostly white or whitish); leaves at maturity sparingly pubescent or glabrous; blades elliptic or obovate, usually narrowed about equally to both ends, 2.5–4.5 (–6) cm. wide, 5–9 (–14) cm. long, 1.8–2.3 times as long as wide, bluntly short-acuminate and decurved at the apex, the basal margins straight, forming a right or acute angle, often cuneately decurrent on the channeled petiole up to 1.5 mm. in diameter, 8–16 mm. long; midvein impressed above; principal lateral veins 8–12 pairs in addition to various intermediate ones, ascending, slender, evident on both surfaces when dry, some of the small connecting veins often joining at right angles; marginal vein about equaling the laterals and somewhat arched between them, 1–3 mm. from the margin; upper surface smooth, the glands usually not apparent; lower surface finely gland-dotted; inflorescence an axillary raceme 3–5 (–8) cm. long with 3–5 opposite (or subopposite) and decussate pairs of flowers; terminal flower sometimes present; lowermost node (in the leaf-axil) often bearing a second short raceme in addition to the primary one; pedicels at anthesis about 0.4 mm. in diameter, up to 10 (–20) mm. long, the upper ones shorter; fruiting pedicels up to 1.5 mm. in diameter; bracts oblong to linear, scarious, 1.5–2 mm. long, mostly deciduous before anthesis; bracteoles distinct, narrowly deltoid, 1.3–1.5 mm. long, deciduous soon after anthesis; buds about 4.5 mm. long, the conic hypanthium 1–1.5 mm. long, abruptly expanded above into the relatively large calyx; calyx-lobes in 2 unequal pairs, appressed-pubescent on both sides, the outer pair ovate, the inner quadrate-rounded and larger, up to 2.5 mm. wide, 2.5–3.5 mm. long, both pairs persistently concave in anthesis but loosely spreading or recurved from the base; hypanthium soon elongating and becoming ellipsoid-oblong with a distinct neck below the persistent and somewhat accrescent calyx; disk 2.7–3.3 mm. wide, often somewhat quadrate, the staminal ring short-bristly, the concave center with a few long hairs; style 7–8.5 mm. long, sparingly pilose in the lower half; stamens about 125, 6–8 mm. long, the anthers 0.5–0.7 mm. long; petals white, ca. 5–6 mm. long and wide; ovary bilocular, the ovules 9–12 in each locule, in a subcapitate group arising from the central dissepiment; mature fruit "red, size of a cherry" (Schipp), ellipsoid (1.5 cm. long, 1 cm. thick) to oblong (0.8 cm. thick, 1.6 cm. long), sometimes curved, or enlarged distally, crowned by the persistent calyx.

For a note on the nomenclature of this species see Sandwith, N. Y., Kew Bull. 1934: 124–126. 1934.

Eugenia amatenangensis Lundell, Wrightia 3: 10. 1961.

To be sought in Guatemala. Known only from the type, collected on a river side, Amatenango del Valle, Chiapas, 1835 m., E. Matuda 5832.

A tree 3 meters high, glabrescent, the branchlets and young leaves and the inflorescence more or less densely appressed-pubescent with coarse pale gray or sordid hairs 0.2–0.4 mm. long; leaves rigidly coriaceous, elliptic, 2.5–3.5 cm. wide, 4.5–7 cm. long, about 2–2.3 times as long as wide, short-acuminate, cuneate at base, the margins decurrent on the inner angles of the channeled petiole 5–8 mm. long; midvein acutely but rather broadly impressed above; lateral veins about 8 on each side, inconspicuous above, more evident beneath, connected by a series of irregular arches 1–2 mm. from the margin, the marginal vein as such not well developed; leaves green and glossy above, gland-dotted and apparently paler beneath; flowers sessile and glomerate in the axils, the raceme-axis (sometimes 2 superposed) stout, 1–3 mm. long, bearing 3–5 pairs of flowers; bracts 1 mm. long or more, their smooth indurate persistent bases rounded, about 1 mm. long and wide; bracteoles broadly ovate, obtuse, persistent but not connate, dorsally somewhat silky-strigose, about 1 mm. long and wide; buds 2.5 mm. long; hypanthium campanulate, 1 mm. long or a little more, densely pale-silky-strigose; calyx-lobes rounded, glabrous within, up to 1.3 mm. long and wide, the outer surface silky-strigose about as densely as the hypanthium; disk glabrous, 1.3 mm. wide; style 5–6 mm. long; stamens probably about 50, about as long as the style, the anthers 0.5 mm. long; petals about 3 mm. long; ovary bilocular, the ovules 5–8 in a compact group in each locule; fruit (slightly immature) red, oblong-ellipsoid, about 6 mm. in diameter, 10 mm. long.

Eugenia argyrea Lundell, Wrightia 3: 10. 1961.

Hedges, hillsides, forest, dry stream beds, old pastures, mostly in lowlands of the Atlantic slope, but up to 1200 meters or more; Izabal; Alta Verapaz. Mexico [Veracruz to Chiapas (near Siltepec, E. Matuda 5074, the type)]; Honduras; Nicaragua; Costa Rica; Panama; Colombia (Santa Marta, H. H. Smith 907).

A shrub 2–3 meters high, or a tree up to 6–15 meters, the inflorescence and the youngest branchlets and leaves densely clothed with lustrous appressed (antrorse) simple coppery or golden hairs up to 0.5 mm. long; older leafy branchlets, and leaves (at least the upper surface), glabrous at flowering time; leaves elliptic-ovate, or elliptic, often broadly so, 1.5–3 (–5) cm. wide, 3–6 (–10) cm. long, 1.6–2.5 times as long as wide, rather gradually deltoid-acuminate or narrowly acuminate, somewhat rounded or usually cuneate at base, the margins decurrent on the inner angles of the channeled petiole 4–7 (–10) mm. long; midvein sulcate above in the otherwise plane surface of the blade; lateral veins obscure, 4–6 (–8) on each side, scarcely apparent above in dried leaves, more prominent beneath, ascending; marginal vein about as strong as the lateral ones or a little weaker, sometimes ill-defined, 1–2.5 mm. from the margin; blades nearly concolorous, apparently dull and nearly featureless above, sometimes sparingly appressed-pubescent beneath at maturity but opaque, the glands apparent only in young leaves; inflorescence an axillary raceme, 2–3 usually superposed, the axis 2–6 (–10) mm. long, bearing up to 6 (rarely –9) pairs of flowers on pedicels 2–7 mm. long, up to 0.5 mm. thick in fruit; bracts dark, somewhat indurated at base, ovate-deltoid, less than 1 mm. long; bracteoles glabrous or nearly so, glandular-verrucose, broadly ovate, connate and forming a boat-shaped involucre 1.3–1.5 mm. wide, 0.5 mm. high; buds

2.5–3.5 mm. long; hypanthium campanulate, 1 mm. long, densely tawny pubescent with appressed glistening hairs; calyx-lobes in unequal pairs, rounded, nearly glabrous, the outer pair about 1.3 mm. wide, nearly 1 mm. long, the inner pair up to 2 mm. wide and 1 mm. long; disk 1–1.4 mm. wide, hairy around the base of the style; style 5–6.5 mm. long, hairy in the proximal third; stamens about 50, up to 5 mm. long, the anthers 0.6 mm. long; petals greenish white; ovary bilocular, the ovules 8–10 in each locule; fruit obovoid or short-ellipsoid, black, often substipitate, 5–8 mm. in diameter, 6–10 mm. long.

Eugenia axillaris (Sw.) Willd. Sp. Pl. 2: 970. 1800. *Myrtus axillaris* Sw. Prodr. 78. 1788. *E. guttata* Lundell, Wrightia 2: 207. Sep. 1961. *E. cozumelensis* Lundell, Wrightia 3: 13. Dec. 1961.

Moist or wet forests or thickets, at low elevations; Petén; Santa Rosa. Veracruz; Yucatán Peninsula of Mexico; British Honduras; Honduras; southern Florida; West Indies, the type from Jamaica.

A small tree to 7 meters high, 15 cm. in diameter, glabrous except for appressed small coppery hairs on the vegetative buds and similar hairs on the margins of the bracts, bracteoles and calyx-lobes; leaves coriaceous, ovate or rhombic-ovate, sometimes elliptic, 1.5–3.5 cm. wide, 3–6.5 cm. long, 1.7–2.2 times as long as wide, bluntly acuminate or merely obtusely pointed, rather abruptly narrowed to the acute or cuneate base, the thick cartilaginous margins decurrent on the splayed summit of the flat or concave petiole 5–8 mm. long, up to 1.5 mm. thick near base; midvein sulcate above; lateral veins 5–8 pairs in addition to some intermediates, inconspicuous but in dried leaves apparent as fine convex lines on both surfaces; marginal vein about equaling the laterals and strongly arched between them, well separated (1–3 mm.) from the margin; leaves smooth (lustrous?) above, dull and usually drying brown beneath; glands evident beneath, or in leaves dried at anthesis often apparent as convexities on both surfaces; inflorescence a short axillary raceme (often with 1–2 additional superposed shorter racemes or with an extra flower at some nodes of the axis), the crowded axis somewhat quadrangular, 3–4 (–7) mm. long, with (3–) 5–7 opposite decussate pairs of flowers on pedicels up to 3 mm. long; bracts ovate or broader, incurved, scarious, subpersistent, about 0.6 mm. long and 0.8 mm. wide; bracteoles usually united by their proximal margins, forming beneath the hypanthium a persistent compressed cup 0.4–0.5 mm. high, 0.7–1 mm. long; buds 1.5–2.7 mm. long, the hypanthium cup-shaped; calyx-lobes in 2 unequal pairs, broadly rounded, 0.7–1.2 mm. broad, 0.5–0.7 (–1) mm. long, concave; disk about 1 mm. wide, glabrous; style 3–4.5 mm. long; stamens about 40, up to 3–4 mm. long, the anthers 0.4 mm. long; petals 2–3 mm. long, white; ovary bilocular, the ovules 7–10 in each locule, radiating in a subcapitate group from a centrally affixed placenta; fruit blue-black, globose or oblate, 7–8 mm. in diameter.

Perhaps as many as a score of species, and hundreds of specimens, from Mexico and Central America, have in the past been misidentified as *Eugenia axillaris*, and so cited in various publications. The true *axillaris* is primarily West Indian in distribution, but appears to be well scattered also in the Yucatán Peninsula as far south as

Petén. Records of *axillaris* from other localities in Mexico and Central America should be regarded with caution.

Most West Indian specimens of *axillaris* are quite glabrous except that some floral parts are ciliate. Some specimens that are otherwise indistinguishable, however, especially in Florida and in Central America, but also rarely in the West Indies, are bristly-pubescent on the young growth and in the inflorescence. The taxonomic significance of this is unknown. The type of *Eugenia cozumelensis* (from Cozumel Island, Steere 2640) is pubescent but would otherwise be referred to *E. axillaris*. The original specimens of *E. guttata* (Petén, Tikal National Park, E. Contreras 25, the type, and Contreras 338) are glabrous, and are exactly like West Indian specimens of *axillaris* as I understand that species.

***Eugenia balancanensis* Lundell, Phytologia 1: 481. 1941.**

To be sought in Guatemala. Known only from the type collection, from advanced forest near Balancán, Tabasco, E. Matuda 3361.

Tree 4 meters high, quite glabrous except for a very few stiff appressed hairs on the youngest vegetative growth, and the finely ciliate margins of the bracts, bracteoles and calyx-lobes; leaves lance-ovate, 1.5–3.5 cm. wide, 4–9.5 cm. long, 2.5–3 times as long as wide, gradually and bluntly but rather slenderly acuminate at tip, rounded to acute at base, the margins at the very base cuneately decurrent on the inner angles of the channeled petiole 3–6 mm. long; midvein in mature leaves convex above when dry; lateral veins 7–10 on each side, inconspicuous above, more evident beneath; marginal vein about as strong as the lateral ones and arched between them, 1.5–3 mm. from the margin; blades green and apparently dull above, paler beneath and minutely dark-dotted (glands evident in young leaves but not at maturity); inflorescence an axillary raceme (or 2 racemes superposed), the axis 4–10 mm. long, bearing 3–5 opposite or subopposite and decussate pairs of flowers on pedicels 2–5 mm. long; bracts 0.5–0.8 mm. long, strigose on the backs, deciduous at anthesis except the glabrous indurated base; bracteoles 0.5 mm. long, broadly ovate, obtuse, persistent, not connate; buds and flowers not seen; hypanthium just after anthesis broadly campanulate, rounded at base, 0.7–1 mm. long; calyx-lobes thin, rounded, longer than wide or suborbicular, the larger ones 1.5 mm. long; disk about 1.5 mm. wide; style not seen; stamens about 60; ovary bilocular, the ovules 5–6 in a compact group in each locule; fruit unknown.

***Eugenia biflora* (L.) DC. Prodr. 3: 276. 1828. *Myrtus biflora* L. Syst. Nat. ed. 10. 1056. 1759.**

Wet mixed forest, in British Honduras sometimes growing in mangrove swamps, at or near sea level; Izabal. Mexico (Chiapas); British Honduras; West Indies; Costa Rica; Panamá; lowlands of northern South America, to eastern Peru and Bolivia.

Shrub or small tree up to 6–8 meters high, pubescent, often with conspicuous pale appressed silvery-silky pubescence on the inflorescence and young growth, the hairs up to 1 mm. long; leaves usually lanceolate, varying to ovate or to very narrowly lance-linear, (0.5–) 1–1.5 (–3) cm. wide, 5–8 (–10) cm. long, 3–4 times as long as wide (twice as long as wide in ovate-leaved forms, and up to 15 times in very narrow-leaved forms); blades flat and silky or glabrous beneath, the upper surface with numerous impressed glands, occasionally glabrous, usually sparingly beset with white cobwebby hairs up to 1 mm. long; blades prominently long-acuminate, almost caudate, the acumen often slender and curved, normally prominently mucronate; base of blade rounded or cuneate; petiole channeled above; stout, 2.5–4 mm. long; midvein impressed above, prominently raised beneath, lateral veins very slender, 12–20 pairs, often not apparent in dried material or evident on the lower surface only; marginal vein about as conspicuous as the laterals and little arched between them, 1 mm. or less from margin; inflorescence axillary, usually short and racemoid, the axis 0.5–1.5 (–3) cm. long, about 6-flowered, the terminal flower usually aborting; pedicels 4.5–12 mm. long, 0.5 mm. thick, often longer than the axis, appressed or ascending in flower, spreading in fruit; bracts somewhat persistent, paired, narrowly triangular, acute, 2–3 mm. long; bracteoles like the bracts but broader and connate-perfoliate, forming a boat-shaped cup about 1 mm. high and 3.5–4.5 mm. long, which is persistent until after the fruit matures; margins of the bracteoles often scarious, glabrous; calyx-lobes 4, oblong with rounded tip, silky on both sides, at maturity 2 mm. wide, 2–2.5 mm. long; disk flat, strongly 4-angled, about 2 mm. wide, somewhat pubescent or the center glabrous; style 4–6 mm. long, glabrous; petals white, elliptic, about 3 mm. wide, 5 mm. long, ciliate-fringed at tip; stamens about 50, 4–7 mm. long; fruit oblong or subglobose, glandular-verruculose, about 6 mm. long and nearly as thick.

The inflorescence in this species is extremely plastic. It may be regarded as an axillary branch which may at one extreme be so much reduced that the axis is not readily apparent and the "raceme" appears as a solitary axillary flower. At the other extreme the "raceme" may bear one or two pairs of flowers at the base and continue above this as a leafy vegetative branch. The inflorescence may be strictly "racemose," that is, with 2–5 pairs of opposite, decussate flowers; in slightly more expanded variants, the upper nodes may bear 2 flowers each, or the lowermost node may bear 2 short racemes instead of 2 solitary flowers; in this latter case the lowermost node is actually in the axil of the leaf, and the inflorescence appears as 3 racemes, one above another in the axil.

Because of this plasticity of the inflorescence, and because of the unusually high degree of variability in the foliage of this species, many segregate species have been described. For a synopsis of the West Indian taxa belonging to this complex, see Bot. Jahrb. 19: 628–632. 1895; for additional synonymy pertaining to South American taxa, see Field Mus. Bot. 13, pt. 4: 684. 1958. Two taxa treated

in this Flora as distinct species, *Eugenia Karwinskyana* and *E. yucatanensis*, are perhaps too closely related to *E. biflora* (cf. *Fieldiana, Bot.* 29: 428-430. 1963).

***Eugenia bumelioides* Standl.** *Carneg. Inst. Wash. Publ.* 461: 75. 1935. *E. tapirorum* Standl. *Field Mus. Bot.* 9: 321. 1940.

Dense wet mixed forest, 650 meters or less; Petén. Mexico (Tabasco); British Honduras, the type from Camp 32, British Honduras-Guatemala boundary, W. A. Schipp 1270; Honduras (Dept. Atlántida, Mt. Cangrejal, near La Ceiba, Yuncker et al. 8700, type of *E. tapirorum*).

A tree 6-8 meters high, 10 cm. in diameter, ferruginous-tomentose when young; leaves and branchlets glabrate, or the latter persistently puberulent; young growth and inflorescence (including the hypanthium and both surfaces of the calyx-lobes) densely matted with coppery-brown shining irregularly contorted and appressed dibrachiate hairs up to 0.5 mm. long, these sparingly persistent even in fruit; leaves elliptic-ovate or -obovate, caudate-acuminate, 1.7-4 cm. wide, 4-8 cm. long, 1.7-2.7 times as long as wide, the slender obtuse apex 7-12 mm. long, shorter in some small leaves; base of blade acute, the margins cuneately decurrent on the channeled petiole 4-8 mm. long; midvein impressed above; lateral veins about 10-15 pairs in addition to some intermediate ones, obscure, ascending and parallel; marginal vein about equaling the laterals and somewhat arched between them, 0.5-1.5 mm. from the margin; blades strongly discolored in drying, dark green and apparently lustrous above, paler and sparingly dark-dotted beneath; inflorescence a short axillary raceme up to 3-5 mm. long, bearing 1-3 opposite and decussate pairs of flowers on pedicels 5-6 mm. long (or a few flowers solitary at leafless nodes near the bases of new shoots); buds 3.5-4 mm. long, pyriform, the hypanthium narrowly cup-shaped, 1.5 mm. long; bracts broadly ovate, dark, scariosus, about 0.7 mm. long and wide; bracteoles distinct, narrowly ovate, acute, persistent, 1-1.5 mm. long; calyx-lobes suborbicular, about 1.5 mm. long and wide (-2 mm. in fruit); disk 1.5-1.7 mm. wide, hairy; style about 5.5 mm. long; stamens about 100, up to 5 mm. long, the anthers 0.4 mm. long; petals obovate, 3.5 mm. long; ovary bilocular, the ovules 12-15 in each locule, in a subcapitate group; fruit globose or essentially so, glandular-verrucose, black, glabrous or nearly so, 10-12 mm. in diameter or more.

***Eugenia buxifolia* (Sw.) Willd.** *Sp. Pl.* 2: 960. 1800. *Myrtus buxifolia* Sw. *Prodr.* 78. 1788. *E. mayana* Standl. *Contr. U. S. Nat. Herb.* 23: 1042. 1924. *Guayabillo*.

In advanced deciduous forest, or in second growth, in calcareous regions, near sea level; Petén. British Honduras (Caves, Stann Creek Railway, W. A. Schipp 427); Yucatán Peninsula of Mexico (the type of *E. mayana* from Yucatán, Gaumer 714); southern Florida; Bahamas; Greater Antilles; St. Thomas; St. Croix.

A small tree, up to 12 meters high, the trunk up to 12 cm. in diameter; branchlets, inflorescence, petioles and at least the young leaves puberulent, bearing numerous erect or incurved sharp hairs up to 0.3 mm. long; leaves obovate or elliptic, widest at or above the middle, 1–2.5 cm. wide, 2.5–5.5 cm. long, 1.5–2.3 times as long as wide, mostly rounded at apex, cuneate at base, the margins often revolute, decurrent on the straight terete or plano-convex petioles 1.5–3 mm. long; midvein on the upper surface flat or sulcate, often persistently pubescent; lateral veins few and irregular, 2–5 on each side, at least 1 or 2 basal ones strongly ascending, the apical ones usually recurving and joining the next succeeding ones, but a definite marginal vein not formed; glands not apparent on the upper surface, usually small but evident on the lower; inflorescence an axillary raceme, or 2–3 racemes superposed, the axis 1–4 mm. long with 2–5 decussate pairs of flowers, the terminal flower usually aborted; pedicels 1–2 mm. long, ascending; bracts sub-persistent, 0.5 mm. long; bracteoles persistent, ovate, acute or obtuse, scarious, convex on the backs, not connate, 0.4–0.6 mm. long; buds 1.5 mm. long, the hypanthium cup-shaped, lightly pubescent; calyx-lobes 4, about equal, scarious, rounded, ciliate, glabrous within, 0.5–0.7 mm. long and wide; disk 1–1.5 mm. wide, sometimes quadrate; style glabrous, 3.5 mm. long; stamens about 40, about 2.5 mm. long, the anthers 0.3 mm. long; petals glabrous, about 1.7 mm. long and wide; ovary bilocular, the ovules 5–6 in a subcapitate group in each locule; fruit globose or oblate, about 5 mm. in diameter, black.

The Maya names of Yucatán are "sacloob" and "khilnich."

There seems to be no obvious difference between Central American and West Indian material of this species, except that in some Antillean specimens the branchlets are glabrous or nearly so, a fact long ago noted by Urban (Bot. Jahrb. 19: 639. 1895).

Eugenia cacuminum Standl. & Steyermark. Field Mus. Bot. 22: 357. 1940.

Known only from the type, Dept. Chiquimula, Montaña Nube (Montaña Volcancitos), between Socorro Mountain and Cerro Brujo, southeast of Concepción de las Minas, 1500–1700 meters, Steyermark 30903.

A shrub 3 meters high, nearly glabrous at maturity, the young branchlets and petioles and the inflorescence finely hispidulous; leaves coriaceous, rigid in drying, elliptic or varying to narrowly ovate, 1.5–3 cm. wide, 3–7 cm. long, 2–2.5 times as long as wide, obtusely pointed or bluntly acuminate, acute at base, the thick revolute margins decurrent on the nearly terete shallowly channeled petiole 4–6 mm. long; midvein pale above, concave in the flat surface of the blade; lateral veins 5–6 on each side, inconspicuous especially above, more evident beneath, connected by irregularly angled arches 1.5–3 mm. from the margin, the marginal vein ill-defined; blades dark green and glossy above, paler and somewhat obscurely gland-dotted beneath; inflorescence an abbreviated axillary raceme, the axis 4-angled, 2 mm. long or less, bearing 1–2 approximate pairs of sessile flowers (or the pedicels up to 0.7 mm. long and thick); bracts indurate, ovate, 1 mm. long; bracteoles elliptic-ovate, blunt, distinct, probably deciduous, about 0.7 mm. long and

wide; buds not seen; hypanthium probably 1.5–2 mm. long in anthesis, minutely pubescent, its body from the earliest stages nearly globose and prominently 8-ridged, constricted above into a narrow neck, then abruptly expanded into the large subfoliaceous calyx; wing-like ridges of the half-grown fruit 2–2.5 mm. high, extending through the narrow neck to the base of the calyx, their height about equal to the thickness of the body; calyx-lobes rotund, membranous, ciliate, minutely puberulent without, glabrous within, concave, up to 4 mm. long and wide, pale and prominent on the immature fruit; disk 3.5 mm. wide; immature fruit apparently fleshy, shrunken in drying, the body including the wings about 8 mm. in diameter, 1 cm. long including the neck; ovary bilocular, the ovules 5 in each locule.

Eugenia Capuli (Schlecht. & Cham.) Berg, Linnaea 27: 238. 1856. *Myrtus Capuli* Schlecht. & Cham. Linnaea 5: 561. 1830. *Eugenia Schiedeana* Schlecht. Linnaea 13: 418. 1839. *E. Capuli a micrantha* Berg, Linnaea 27: 239. 1856. *E. Capuli β macroterantha* Berg, Linnaea 27: 239. 1856. *E. Capuli γ rigida* Berg, Linnaea 29: 238. 1858. *E. Contrerasii* Lundell, Wrightia 2: 206. Sep. 1961. *E. tenuissima* Lundell, Wrightia 3: 19. Dec. 1961.

Forested hills, ridges, river bluffs, mostly at low or very low elevations; Petén (Tikal National Park, Lundell 16597, the type of *E. Contrerasii*); Alta Verapaz; Izabal; Escuintla; perhaps also in Chiquimula, Retalhuleu, and Huehuetenango. Mexico (west to Jalisco and Sinaloa; north to Tamaulipas, the type from Papantla, Veracruz, Schiede); British Honduras; Honduras.

Shrub or small slender tree to 8 meters high, 10 cm. in diameter, hispidulous, the foliage glabrate, the inflorescence, branchlets and young growth densely beset with small sharp erect or ascending hairs 0.1–0.2 mm. long; leaves ovate, lanceolate or sometimes elliptic, usually broadest below the middle, (0.8–) 1.5–2.5 cm. wide, (2–) 3–6.5 cm. long, 2–3 (–4) times as long as wide, about equally narrowed to both ends, or (usually) prolonged distally, the apex narrow and blunt, acute or acuminate, often caudate-acuminate with slender tip 1 cm. long; base cuneate (usually) or acute, the margins decurrent on the inner angles of the flat or concave petiole 3–5 mm. long; midvein flat or convex above; lateral veins ascending, 6–10 pairs, inconspicuous above, more evident beneath; marginal vein about as thick as the laterals, arched between them, 1–2 mm. from the margin; leaves dark green above, paler and often drying brown beneath; glands in young dried leaves often seen as convexities on both surfaces, in older leaves usually evident as dark points on the lower surface; inflorescence a short axillary raceme, sometimes with 1–2 additional racemes superposed, the axis 3–6 (–16) mm. long, bearing 3–4 opposite decussate pairs of flowers on pedicels 3–5 mm. long; buds 2 mm. long, pyriform; bracts scarious, 0.5–1 mm. long; bracteoles ovate, obtuse, persistent, about 0.5 mm. long and wide, nearly contiguous at base; hypanthium campanulate, very finely puberulent, 1 mm. long; calyx lobes in 2 unequal pairs, thin, pubescent on both sides, broadly rounded, 0.8–1 mm. wide and nearly as long; disk about 0.9 mm. wide, glabrous or nearly so; style about 4–5.5 mm. long; sta-

mens ca. 50, up to 3 mm. long; petals white; ovary bilocular, the ovules in each locule ca. 8–10, radiating from a centrally attached placenta; fruit probably black, globose, ca. 5 mm. in diameter.

This species is not clearly distinct from a West Indian species, *Eugenia monticola* (Sw.) DC., and by some it is regarded as a variety of *E. monticola* (cf. Urban, Bot. Jahrb. 19: 636. 1895). For notes on the taxonomy of *E. Capuli* and related species, see Fieldiana, Bot. 29: 432–435. 1963.

A very narrow-leaved plant that may be a form of *E. Capuli*, namely *E. Lindeniana* Berg, Linnaea 29: 240. 1858, is known from Tabasco (*Linden* 619, the type) and Oaxaca, but apparently has not been found in Guatemala. The leaves are narrowly lanceolate or linear-lanceolate, about 1 cm. wide or less, 6–8 times as long as wide.

Eugenia capuloides Lundell, Contr. Univ. Mich. Herb. 7: 32. 1942. *Escoba* (Huehuetenango, according to Standley).

Forested mountains, in advanced forest, or along rivers, 1000–1800 meters; Huehuetenango (between La Libertad and Paso del Boquerón, along Río Trapichillo, Standley 51106). Mexico (Chiapas, near Siltepec, *E. Matuda* 4521, the type).

A shrub or small tree up to 5 meters high, quite glabrous except the ciliate tips of the bracts; leaves narrowly elliptic or lance-elliptic, often about equally narrowed to a slender but obtuse acumen and an acute or cuneate base, 1.3–2.6 cm. wide, 3.5–8.5 cm. long, about 2.6–4 times as long as wide, the margins at base cuneately decurrent on the inner angles of the channeled petiole 2.5–5 mm. long; midvein flat or slightly elevated above on the plane surface of the blade, usually appearing as a pair of closely parallel convex ridges with a shallow furrow between them; lateral veins 5–7 on each side, inconspicuous, more evident beneath, the lowest 1–2 pairs leaving the midvein at a narrow angle and ascending more or less parallel to the margin, the distal veins diverging and nearly straight, passing into a nearly straight marginal vein 1–2 mm. from the margin; blades nearly concolorous, usually gland-dotted beneath, sometimes with glandular convexities above; inflorescence an axillary raceme (usually solitary, but occasionally 2–3 superposed), the axis up to 5–7 mm. long, with 4–6 opposite and decussate floriferous nodes; racemes proliferous, the flowers often 2–3 in the axil of each bract; pedicels 1.5–3 mm. long; bracts scarious, subpersistent, ovate, divaricate, 0.5–0.7 mm. long; bracteoles rounded or truncate, thickened and glandular at base, persistent but not connate, 0.5 mm. long; buds about 2.5 mm. long, pyriform, the campanulate hypanthium 1 mm. long or a little more, dotted with convex glands; calyx-lobes broadly rounded, the larger ones 1–1.2 mm. long and wide; disk 1–1.2 mm. wide in flower; style not seen; stamens about 50; petals white, obovate, about 2.5 mm. long; ovary bilocular, the ovules 5–6 in each locule, pendent in a loose group; fruit apparently globose, 5–6 mm. in diameter.

Eugenia cervina Standl. & Steyermark. Field Mus. Bot. 23: 128. 1944. *Cacho de venado*.

Wet forest, 400 meters or less; Alta Verapaz, the type from near Río Icvolay, 5 miles northwest of Cubilgüitz, Steyermark 44691. Endemic.

Tree 8–12 meters tall, the young branchlets and petioles, inflorescence and lower leaf-surface densely appressed-pubescent with lustrous coppery dibrachiate hairs up to about 0.5 mm. long; leaves persistently tomentose beneath with a close coat of similar but paler ("silvery brown" or "buff brown") hairs; leaves elliptic or elliptic-ob lanceolate, 2.5–5.5 cm. wide, 9–20 cm. long, (3–) 4 times as long as wide, about equally narrowed to the caudate-acuminate tip 1–2 cm. long, and to the acute base, the margins rather abruptly decurrent on the petioles 6–8 mm. long, 1.3–1.5 mm. thick; midvein sharply and narrowly impressed above; lateral veins 15–20 on each side, inconspicuous, ascending, rather close and parallel, convex above, mostly obscured by the tomentum beneath; marginal vein about equaling the lateral ones and arched between them, 0.5–2 mm. from the margin; leaves dark green and probably glossy above, obscurely glandular-verrucose, the lower surface covered by the tomentum; inflorescence racemose, the axis almost none or up to 6 mm. long, 2 mm. thick, the flowers 4 pairs or fewer, nearly sessile, the fruiting pedicels up to about 1.5 mm. long and thick; bracts probably short and indurated; bracteoles persistent, becoming indurated, ovate-orbicular, in fruit 2–2.5 mm. long and wide, glabrous within, barely connate and forming a tomentulose involucre that persists when the fruit falls; flowers and buds not seen; fruit "buff-brown or tinged with rose," subglobose, tomentulose, 1.8–2.3 cm. in diameter, crowned by the broadly rounded calyx-lobes, these up to 4 mm. long and wide, appressed-pubescent on both sides with pale reddish hairs; disk (3.5–) 4.5 mm. wide.

Eugenia chiapensis Lundell, Amer. Midl. Nat. 20: 238. 1938.

A mountain species, collected at an elevation of 1600 meters; to be expected in Guatemala. Known only from near Siltepec, Chiapas, less than 50 km. from the Guatemala border, Matuda 1904, the type.

A tree 4 meters high, 10 cm. in diameter, the youngest branchlets and leaves densely tomentose with brown contorted hairs up to 1 mm. long; hairs soon deciduous, the mature foliage, branchlets and inflorescence glabrous except for a few cilia on the perianth-segments; leaves elliptic, 3–5.5 cm. wide, 8–15 cm. long, about 2.5–3.5 times as long as wide, about equally narrowed to the bluntly short-acuminate tip and the somewhat rounded base, the margins at the very base cuneately decurrent on the sulcate petiole 8–12 mm. long, 1.5 mm. thick; midvein impressed above; lateral veins about 10 on each side, evident on both surfaces, more conspicuous beneath, connected by symmetrical rounded arches about 2–4 mm. from the margin; blades probably dark green and lustrous above, paler beneath and abundantly dotted with small convex resinous glands; flowers 1–3 in sessile umbel-like groups from short spurs at leafless nodes, surely racemose but the crowded axes suppressed, the slender pedicels 8–16 mm. long and 0.7 mm. thick seeming to arise directly from the node; bracts broad, indurated; bracteoles membranous, rounded, divaricate, broadly ovate, connate and forming a persistent involucre 2–2.2 mm. wide; buds pyriform, 7–8 mm. long; hypanthium

2.5 mm. long, substipitate, abruptly expanded into the globe of the perianth; calyx-lobes rounded, membranous, gland-dotted, in unequal pairs, the larger ones up to 6 mm. long and wide; disk quadrate, 3.5–4 mm. wide; style 10 mm. long; stamens about 200, the anthers 1.5–1.7 mm. long; petals gland-dotted, 10–12 mm. long and wide; ovary bilocular, the ovules about 8 in each locule, stalked, radiating in one plane and forming a peltate group; fruit fleshy, probably globose, about 2.5 cm. in diameter.

Eugenia chinajensis Standl. & Steyermark. Field Mus. Bot. 23: 129. 1944.

Savannahs and savannah borders, 100–300 meters; endemic; Alta Verapaz, the type from the south side of Cerro Chinajá, Steyermark 45142.

A shrub 1.5–4.5 meters high, setose, the branchlets, inflorescence and lower leaf-surfaces covered with erect stiff sharp hollow reddish-brown hairs up to 1–1.2 mm. long; leaves glabrate above except the midvein, oblong-elliptic, 1.2–4 cm. wide, 3.5–9.5 cm. long, 2.5–3.5 times as long as wide, gradually and broadly acuminate or the tip acute; blades somewhat narrowed below the middle, then abruptly rounded to a subcordate base, often appearing subsessile, the strongly revolute margins passing abruptly onto the petiole and seeming to meet across the flat base of the midvein in a zone marked by elevated persistent bases of hairs; petiole 2.5–3 mm. long; midvein (above the flat base) depressed below the surface of the blade, rather persistently setose; lateral veins (7–) 10–12 on each side, distant, clearly marked as fine lines above, evident but less conspicuous beneath; marginal vein about equaling the lateral ones, forming long high asymmetrical arches 2–4 mm. from the margin; blades "dull green" above, paler and drying reddish brown beneath; glands inconspicuous; flowers in small sessile axillary glomerules, the stout racemose axis 2–2.5 mm. long, 1.5 mm. thick, bearing about 2–3 approximate decussate pairs of flowers, the axis itself concealed even after the fruit has fallen by the prominently setose-fringed narrow bracts, and the similar but broader bracteoles which are round-obovate, glabrous within, about 0.7 mm. long and wide, not connate but forming a persistent involucre; buds probably about 2 mm. long, obovoid, the glabrous hypanthium campanulate or hemispheric; calyx-lobes 4, concave, in unequal pairs, glabrous within, setose without and on the margins, the outer ones rounded or broadly pointed, 1 mm. long, the inner ones broadly rounded, 1.5–1.7 mm. long and wide; disk glabrous, 1.5–1.8 mm. wide; style not seen; stamens 35–40, the anthers 0.4 mm. long; petals suborbicular, nearly eciliate, about 2.5 mm. long; ovary bilocular, the ovules 3 in each locule, collateral; fruit nearly glabrous, coarsely glandular-verruculose, subglobose or in 2-seeded forms laterally elongate, about 6 mm. long just before maturity, crowned by the erect persistent calyx-lobes; seed round or hemispheric, 5 mm. long, with very lustrous cartilaginous testa free from the homogeneous embryo.

This is one of the most distinctive species of *Eugenia* discovered in Central America in recent years. The coarsely setose herbage, oblong subcordate leaves and sessile clustered flowers and fruits combine to give it a unique aspect.

Eugenia choapamensis Standl. Field Mus. Bot. 22: 93. 12 June 1940. *E. simiarum* Standl. & Steyermark l.c. 359. 31 Oct. 1940.

Wet lowland forest, 375 meters or less; Izabal (Montaña del Mico, Steyermark 38274, type of *E. simiarum*). Mexico (Oaxaca, Mexia 9254, type; Tabasco; Chiapas).

Tree 7–12 meters high, quite glabrous except the finely ciliate bracts, bracteoles and perianth-parts, and the bristly-hispid staminal ring; leaves at maturity coriaceous, elliptic or elliptic-lanceolate, (2.5–) 4–8 cm. wide, (7.5–) 12–16 cm. long (–22 cm. long on shoots), 2.8–3.3 times as long as wide, about equally narrowed to the gradually and bluntly acuminate tip and to the acute or cuneate base, the thickened callous margins decurrent on the dilated flat or concave summit of the petiole 5–8 mm. long, 1.5 mm. thick; midvein broad and flat or convex above, sometimes with very narrow median channel near base; lateral veins 10–14 on each side in addition to some intermediate ones, straight, inconspicuous above, evident and somewhat elevated beneath, connected by a series of marginal arches 3–5 mm. from the margin; upper surface "rich green," when dry nearly featureless or the veins evident, the lower "silvery pale green" (according to Steyermark), often drying reddish brown, the few large glands scarcely apparent; flowers in nearly sessile umbel-like fascicles on very short spurs at leafless nodes, the inflorescence a much-crowded raceme (or 2–3 superposed), its axis up to 2–3 mm. long (usually shorter), 2 mm. thick, bearing 1–5 approximate pairs of flowers on slender pedicels (4–) 10–18 mm. long (in fruit up to 1 mm. thick); bracts broadly ovate, imbricate, indurate, 1 mm. long; bracteoles persistent, distinct, ovate, obtuse, 1–1.5 mm. long; buds 4.5–6 mm. long, pyriform, the globe of the petals much broader than the cup-shaped hypanthium 1.5–2 mm. long; calyx-lobes deltoid-ovate or broadly rounded, deeply concave, membranous, the larger ones 3–3.5 mm. wide, 2–2.5 mm. long; disk 2.5 mm. wide; style about 7 mm. long; stamens more than 100, longer than the style; petals white; ovary bilocular, the ovules 10–16 in each locule, in a compact group arising centrally from the dissepiment; fruit smooth, black, ellipsoid, 1–1.5 cm. in diameter, 1.5–2.5 cm. long.

Eugenia citroides Lundell, Contr. Herb. Univ. Mich. 7: 33. 1942.

In high wet mountain forests, often in *barrancas* with *Abies*, 2100–2700 meters; San Marcos; Huehuetenango; Quiché. Mexico (Chiapas, the type from near Siltepec, E. Matuda 4554).

A large shrub, or a tree 6–10 meters high, soon glabrate, the young branchlets and foliage softly and sometimes densely tomentose with pale brown somewhat appressed hairs 0.2–0.6 mm. long, some of the hairs dibrachiate but attached very near one end; leaves elliptic or on slowly growing branches obovate, abruptly or gradually acuminate, or occasionally obtuse in obovate leaves, acute at base, the rather thick revolute margins somewhat decurrent on the stout petioles 5–10 mm. long (or longer on vigorous shoots), 1–2 mm. thick; blades 3–5.5 cm. wide, (6–) 8–13 cm. long, 1.8–2.4 times as long as wide; midvein narrowly impressed above; lateral veins 6–10 on each side in addition to some intermediate ones, evident as pale convex lines above, elevated and more prominent beneath, there seeming

stronger than the intermediate veins, connected by a series of irregularly angled arches 3–6 mm. from the margin, a series of small arching submarginal veins beyond these; blades dark green and lustrous above, paler beneath; small convex glands usually evident beneath, sometimes also above; flowers in dense axillary or partly supra-axillary glomerules, as many as 50 or more at a node, often fewer, racemose in arrangement, the racemes usually several crowded together, the individual axes up to 3 mm. long, bearing 3–4 pairs of sessile flowers; bracts ciliate, small and indurate, persistent; bracteoles ciliate, ovate, 1–1.3 mm. long, 0.7 mm. wide, becoming indurated and persistent; buds 3–4 mm. long, pyriform, nearly glabrous, the campanulate hypanthium 1.5 mm. long, strigose; calyx-lobes membranous, glabrous, up to 2 mm. long and wide, the larger ones in fruit 2 mm. wide, 2.5 mm. long; disk 1.7–2 mm. wide, glabrous; style about 6 mm. long; stamens about 50, the anthers 0.5–0.6 mm. long; petals white; ovary bilocular, the ovules 4 in a subcapitate group in each locule; fruits on pedicels up to 1.5 mm. long, 2 mm. thick; fruit subglobose, dark red (according to Standley), 2.7–3.3 cm. in diameter, 3–3.5 cm. long, with thin flesh and massive seed 2.5 cm. long.

Eugenia farameoides A. Rich. Ess. Fl. Cub. 588. 1845. *E. flavifolia* Standl. Field Mus. Bot. 8: 320. 1931. *E. ceibensis* Standl. Field Mus. Bot. 9: 319. 1940.

Pine ridges or open swampy places, at or little above sea level. British Honduras (the type of *E. flavifolia* from Stann Creek Railway, W. A. Schipp 450); Mexico (Oaxaca); Honduras (the type of *E. ceibensis* from near La Ceiba, Dept. of Atlantida, T. G. Yuncker et al. 8309); Cuba.

A shrub or small tree, sometimes 8 meters high with trunk 12–15 cm. in diameter, nearly glabrous, the young branchlets and petioles and the inflorescence minutely pubescent with sharp erect hairs up to 0.1 mm. long; leaves when dried markedly yellow-green, coriaceous, elliptic to ovate, 2–5.5 cm. wide, 5–10 cm. long, 2–3 times as long as wide, acute or acuminate or infrequently broadly rounded, the very tip blunt or rounded even in narrowly acute forms; base gradually or somewhat abruptly rounded, the margins usually (and sometimes cuneately) decurrent on the rough, channeled petiole 1–1.5 mm. thick, 4–8 mm. long; midvein convex on the upper surface, or especially toward the base of the blade flat or even sulcate; lateral veins evident on both surfaces and somewhat elevated (convex) when dry, 5–8 pairs in addition to some intermediate ones, scarcely forming a marginal vein but each arching over (often in a series of angular bends) to join the next succeeding one; blades lustrous and smooth above, paler and dull beneath, the glands usually not apparent on the upper surface, the lower surface usually minutely dark-dotted or even slightly roughened by the glands; inflorescence a short axillary raceme (or two racemes superposed), the axis somewhat 4-angled, 4–12 mm. long, with 4–6 opposite, decussate pairs of flowers; terminal flower usually aborting; pedicels filiform, straight, 3–5 mm. long; bracts scarious, somewhat persistent, 0.5–1 mm. long; bracteoles united by their proximal margins, in anthesis forming a boat-shaped envelope surrounding and concealing the cup-shaped hypanthium, the envelope 0.7 mm. high, 1.5 mm. long; bracteoles in fruit explanate, closely investing the base of the hypanthium, forming a scarious in-

volucere 2 mm. long, 1.5 mm. wide; hypanthium densely and very minutely pubescent with pale appressed hairs unlike those of the pedicels; calyx-lobes 4, broadly rounded, appressed-pubescent on both surfaces, about 1.5 mm. long in anthesis, accrescent, persistent and conspicuous in fruit, when up to 2 mm. wide and long; disk 1.5–1.7 mm. wide, bristly in the staminal ring, and with a dense ring of hairs surrounding the sparsely hairy base of the style; style 7 mm. long; stamens 60–75, about 5 mm. long, the anthers about 0.5 mm. long and wide; petals white, puberulent without, 3–4 mm. long; ovary 2-locular, the ovules 6–7 in each locule, radiating from a small attachment on the central dissepiment; fruit when ripe black (Schipp), transversely oval, 7–8 mm. in the longer axis, about 5 mm. in the shorter, 5–6 mm. high (i.e. from bracteoles to calyx).

Central American specimens of *E. farameoides*, including the plant described as *E. flavifolia*, rather consistently have the leaves 2–3 times as long as wide and the axis of the racemes 6 mm. long or more. Some Cuban specimens are precisely similar, but in others the leaves are often less than twice as long as broad, and the axis of the raceme is much abbreviated.

Eugenia flavoviridis Lundell, Amer. Midl. Nat. 29: 479. 1943.
E. dissitiflora Lundell, Wrightia 2: 207. Sep. 1961. ***E. flava*** Lundell, Wrightia 3: 14. Dec. 1961. *Guayabillo*.

In low forest, often associated with *Metopium* or *Haematoxylum* (*chechemal* or *tintal*); Petén (Santo Toribio, E. Contreras 2684, the type of *E. dissitiflora*). British Honduras (Toledo District, Monkey River, Jenkins Creek, P. H. Gentle 4085, the type).

Treelike, 2–3 meters high, nearly glabrous, the young branchlets and inflorescence sparingly setose-pubescent with coarse sordid antrorsely curved or almost erect hairs 0.2–0.5 mm. long; leaves ovate to oblong or elliptic, 2–4.8 cm. wide, (4) 5.5–9 (–11) cm. long, 2–3 times as long as wide, obtusely acuminate, rounded or acute at base, the margins finally cuneately decurrent on the channeled petiole 4–7 (–11) mm. long; midvein impressed above; lateral veins 8–10 including some intermediate ones, very inconspicuous above, more evident beneath; marginal vein about equaling the lateral ones and arched between them, often irregularly angled, 1.5–4 mm. from the margin; leaves smooth and probably darker green above, often drying yellowish green especially beneath, finely dark-dotted beneath; inflorescence an axillary raceme (or 2–3 racemes superposed), the axis up to 5–12 mm. long, bearing 4–8 pairs of flowers on pedicels 1.5–4 mm. long and up to 0.5 mm. thick in fruit; bracts 0.5–0.8 mm. long, divaricate, subpersistent, or their bases ovate, indurate-persistent; bracteoles broadly deltoid-ovate, ciliate, thin but subpersistent, scarcely connate, broader than long, 0.5 mm. long; buds probably somewhat more than 2 mm. long; flowers not seen; hypanthium hemispheric or short-campanulate, glabrous or nearly so; style about 5 mm. long; fruit globose, 5–6 mm. in diameter or more, probably black, its disk a little more than 1 mm. wide, the calyx-lobes appressed over the disk, flat, obtusely deltoid, the larger ones 0.5–0.6 mm. long, 0.7–1 mm. wide.

Eugenia guatemalensis Donn. Sm. Bot. Gaz. 23: 245. 1897. *E. patalensis* Standl. & Steyermark. Field Mus. Bot. 23: 130. 1944. *Guayabillo*; *silich* (Huehuetenango); *rutzache-ska* (according to Aguilar).

Wooded moist forests, oak or pine forests, or according to Standley on dry open hillsides, 800–2000 meters; Baja Verapaz, the type from Santa Rosa, Tuerckheim 1318; ?Huehuetenango; Santa Rosa; Guatemala; Sacatepéquez; Chimaltenango. Southern Mexico (Edo. de México; Oaxaca; Veracruz; Chiapas); Costa Rica.

A shrub or small tree 2–6 meters high, the branchlets and the lower leaf-surfaces and the inflorescence cinereous- or pale reddish-pubescent (or the inflorescence golden) with very closely appressed small dibrachiate hairs; leaves elliptic to oblanceolate or obovate, 1.5–4 cm. wide, (4–) 5–9 cm. long, 2–2.7 times as long as wide, often about equally narrowed to both ends, gradually or abruptly acuminate (the tip blunt), acute at the base, the margins decurrent on the channeled petiole 7–10 mm. long, 1 mm. thick; midvein impressed above; lateral veins inconspicuous, 8–10 on each side including some intermediate ones; marginal vein about equaling the lateral ones and arched between them, 0.5–2 mm. from the margin; blades lustrous and dark green above, dark- or convex-dotted; inflorescence an axillary raceme (often 1–2 additional ones superposed), the axis 1–2.5 cm. long, bearing up to 5 opposite and decussate pairs of flowers on pedicels 3–7 mm. long; bracts lanceolate, up to 1.5 mm. long; bracteoles scarious, distinct, similar to the bracts, 1–1.5 mm. long, subpersistent; buds 3.5 mm. long; hypanthium densely appressed-pubescent, ovoid, substipitate, 1.5 mm. long; calyx-lobes in unequal pairs, appressed-pubescent on both surfaces, separating in anthesis by splitting in the sinuses between them; smaller lobes deltoid-ovate, 1.5–2 mm. long and wide, the larger ones cucullate-concave, 2.5–3 mm. long and wide; disk 2–2.7 mm. wide, hairy about the base of the style; style 5–6 mm. long; stamens about 125, up to 5 mm. long; petals glabrous, about 4 mm. long; ovary bilocular, the ovules 15–18 in a compact group in each locule; developing fruit pyriform, the mature fruit 1 cm. long or more, probably black and oblong or obovate.

According to Standley (mss.) the mature fruit may be subglobose; no Guatemalan specimens with mature fruits are at hand, but rather numerous specimens from cloud-forest areas in the mountains of Honduras have been referred to *E. guatemalensis* by Standley and others. These specimens have nearly globose fruits, and rather more symmetrically elliptical leaves than Guatemalan plants. No adequate flowering specimens are available; it is probable that these represent another species.

The type of *E. patalensis* Standl. & Steyermark., from Patal, Baja Verapaz, Standley 69568, is a specimen with half-grown fruit. This and other specimens from the type-region of *E. guatemalensis* have more stiffly coriaceous leaves than flowering specimens of that species, and have lost most of their characteristic pubescence except a little on the fruits and the pedicels. For the present this species may be regarded as synonymous with *E. guatemalensis*.

Eugenia hondurensis A. Molina, Ceiba 1: 261. 1951. *E. crassifolia* A. Molina, Ceiba 3: 169. 1953. *E. nicaraguensis* Amsh. Act. Bot. Néerl. 5: 278. 1956.

Wooded moist ravines, moist brushy rocky hills, dense wet mixed forest, 1800 meters or less; to be sought in southeastern Guatemala. Honduras (Choluteca; Morazán, Molina 2559, the type, and Molina 3031, type of *E. crassifolia*); Nicaragua (Chinandega; Chontales, Standley 9427, type of *E. nicaraguensis*; Jinotega).

A shrub or small tree up to 6 meters high, the branchlets, inflorescence, petioles and lower leaf-surfaces tomentose with yellowish-brown or nearly colorless stalked forked hairs, the tomentum reddish in the young growth; leaves soon glabrate above except the midvein; leaves elliptic, oblong, or obovate, (2-) 4-6 (-9) cm. wide, (4-) 6-9 (-15) cm. long, 1.5-2.5 times as long as wide (or even broader on shoots), rounded or obtuse or rarely very shortly acuminate at apex, narrowed from the middle or above to a truncate-auriculate base, the margins abruptly decurrent on the inner angles of a nearly terete channeled petiole 3-5 mm. long, 1.3-1.7 mm. thick; midvein depressed a little on the upper surface, nearly flat or sulcate, rather persistently tomentose; lateral veins 5-6 on each side, evident as pale lines above, more prominent beneath, strongly arcuate-ascending, diminishing distally, curving in at a point 2-4 mm. from the margin to join the next succeeding ones; leaves dull green above, pale beneath because of the persistent tomentum; glands inconspicuous; flowers solitary, axillary, or at the lowest 1-2 (bracteate) nodes of leafy branchlets, the pedicels 9-15 (-30) mm. long, 0.7-1.2 mm. thick, in fruit compressed and 1.5 mm. wide; bracts indurate-scarious, oblong-linear, deciduous at anthesis, 3-4.5 mm. long; bracteoles similar, deciduous at anthesis, 2.5-4.5 mm. long; buds not seen; calyx-lobes rounded, tomentose on both sides, reflexed at anthesis, 4.5-5.5 mm. wide, 4-6 mm. long; disk 5-6 mm. wide, tomentose about the base of the style; style pilose in the proximal one-third, 10-11 mm. long; stamens very numerous (250-300), up to 12 mm. long, the anthers 0.7-1 mm. long; petals white, obovate, ciliate, 8-10 mm. long; ovary bilocular, the ovules (according to Amshoff) 5-10 in each locule; immature fruit ellipsoid-obvoid, obtuse at apex, acute at base, crowned by the calyx, 8-14 mm. in diameter, about 1.5 cm. long.

This species is variable in leaf-form and in pubescence. Flowering specimens look quite unlike those in fruit. With maturity the pubescence falls to a considerable extent, and becomes paler; the leaves become firm, and nearly glabrous beneath. The original specimens of *E. hondurensis* were from mature plants with half-grown fruit; flowering specimens were later described under the name of *crassifolia*.

Eugenia hypargyrea Standl. Contr. U. S. Nat. Herb. 23: 1044. 1924.

In wet forest or partly deciduous forest, probably 1000 meters or less; to be expected in Guatemala. Mexico (Veracruz, near Za-

cuapan, C. A. Purpus 6171, the type; Chiapas); Honduras (Olan-chito, Record & Kuylen H55, H55A.

A tree 10–12 meters high, the branchlets and inflorescence and the youngest leaves closely appressed pubescent with silvery or pale reddish dibrachiate hairs, the leaves permanently silvery-scurfy beneath; leaves obovate or obovate-elliptic, rounded at apex, cuneate at base, 2–4.5 (–7) cm. wide, 5–11 cm. long, (1.5–) 1.8–2.2 times as long as wide, the margins long-decurrent on the nearly terete petiole 5–9 mm. long, 1.3–2 mm. thick; midvein flat or convex above; lateral veins 4–7 on each side, strongly ascending, more conspicuous beneath and stronger than the intermediate ones if any, connected by a series of oblique angular arches 2–8 mm. from the margin; blades dark green, lustrous and glabrate above, the lower surface obscured by hairs so small and densely aggregated as to make the surface appear silvery-cellular; inflorescence a short axillary raceme, the axis 4–7 (–10) mm. long, bearing 1–3 pairs of flowers on pedicels 4–7 mm. long, up to 0.7–1 mm. thick in fruit; bracts ovate, indurate-persistent, 1 mm. long or less; bracteoles persistent, broad, not connate, 0.5–1 mm. long; buds 4–4.5 mm. long; calyx-lobes broadly rounded, in unequal pairs, the larger ones 3–4 mm. long and wide; hypanthium broadly campanulate, 2 mm. long, pale-reddish-tomentulose like both surfaces of the calyx-lobes; disk 2.5–3.5 mm. wide, hairy in the staminal ring and about the base of the style; style about 7 mm. long; stamens about 100; petals glabrous or nearly so; fruit apparently black, oblong-ellipsoid, 8–10 mm. in diameter, 13–15 mm. long, topped by the concave tomentulose calyx-lobes.

Eugenia Ibarrae Lundell, Wrightia 2: 56. 1961. *Chilonche*.

Wooded swamps (*tintales*) dominated by species of *Haematoxylum*, Petén (the type from Bajo de Santa Fé, E. Contreras 19). British Honduras.

Slender shrub, or a small tree 2–5 meters high, with smooth gray bark, quite glabrous except that the bracts and the perianth-lobes are finely reddish-ciliate; leaves rigidly coriaceous, obovate or elliptic, 1.5–3.5 cm. wide, 3–6 cm. long, 1.6–2 times as long as wide, blunt-tipped or rounded, sometimes broadly and obscurely acuminate, cuneate at base, the cartilaginous revolute margins decurrent on the stout short sulcate petiole 2–4 mm. long, up to 1.5 mm. wide; midvein flat to convex above or narrowly sulcate especially near base; lateral veins 4–6, evident on both surfaces in dried leaves, the lowermost pair strongly ascending and passing directly into a marginal vein about equaling the lateral ones and arched between them, the arches well separated (2–4 mm.) from the margin; leaves dark green and lustrous above, paler beneath; glands seen as small convexities above, and as abundant dark dots beneath; flowers 1–2 pairs in sessile (actually racemose) clusters in the axils of foliage leaves or the axils of indurated bracts at the lowest nodes of new leafy branchlets; axis of the raceme up to 1 mm. long and about as thick, the flowers on gross pedicel-like bases 0.5 mm. long and thick; bracts ovate and up to 1.5 mm. long, or the uppermost ones paired, persistent and coriaceous, 1 mm. long and wide, resembling the bracteoles; bracteoles broadly rounded, coriaceous, persistent, connate and forming an involucre 1–1.5 mm. long, 0.5 mm. high in bud, more than 1 mm. wide when expanded; buds 2–2.5 mm. long, pyriform, the campanulate hypanthium 0.7–1 mm. long, abruptly expanded into the

large globe of the perianth; calyx-lobes strongly imbricate, concave, broadly rounded, in unequal pairs, the larger ones 1.5–2.3 mm. wide, 1.5–1.7 mm. long; disk rather ill-defined, about 1.5 mm. wide; style 5–6 mm. long; stamens about 50, the longer ones 5–5.5 mm. long; petals white, ovate or suborbicular, 3–3.5 mm. long; ovary bilocular, the ovules 4 in each locule; fruit globose, reddish purple, 6–10 mm. in diameter, with thin flesh.

Eugenia jutiapensis Standl. & Steyermark. Field Mus. Bot. 23: 129. 1944.

In forests and wooded ravines, 1000 meters or less; Jutiapa, the type from near Jutiapa, *J. R. Johnston* 1480. El Salvador (Santa Tecla, *Calderón* 1423; Dept. Ahuachapán, *Standley* 20129, 20268).

A tree 4–6 meters high, the branchlets, inflorescence and lower surfaces of the leaves (at least on the veins) hirsutulous with fine sharp pale erect hairs 0.5–0.8 mm. long; leaves glabrate above except the midvein; leaves broadly ovate-elliptic, 5–8.5 cm. wide, 9–18 cm. long, 1.6–2.3 times as long as wide, broadly and bluntly short-acuminate, broadly rounded at the cordate base, the two rounded auricles (1–) 2.5–3.5 mm. long; petioles (3–) 4.5–7 mm. long; midvein on the upper surface broadly channeled and hirsutulous nearly its whole length; lateral veins 5–6 on each side, sometimes in addition to a few weaker intermediate ones, widely spaced, diminishing distally, arching over and joining the next succeeding ones, forming a series of asymmetrical arches 5–10 mm. from the margin; veins and small veinlets elevated as pale lines on both surfaces, forming a conspicuous anastomosing network of angular areolae; blades probably dark green above and paler beneath, at least the upper surface drying somewhat purplish brown and sometimes [the upper surface] sparingly beset with resinous glands 0.1–0.2 mm. wide; flowers in sessile umbels at leafless nodes, the racemose axes 1 or more, almost suppressed, up to 1.5 mm. long and thick, bearing up to 3 pairs of flowers on slender pedicels (1–) 2–2.5 cm. long, 0.5–0.8 mm. thick; buds pyriform, 6–7.5 mm. long, the campanulate hypanthium 2.5–3 mm. long, densely velutinous-hirsute; bracts somewhat indurated, hirsute, up to 1 mm. long; bracteoles distinct, ovate, obtuse, 1 mm. long and wide; calyx-lobes "brown-red" (according to Standley), membranous, oblong, short-hirsute outside, minutely puberulent or almost glabrous inside, in unequal pairs, the larger ones 4 mm. wide, 5–6 mm. long, the smaller ones 3 mm. wide, 3.5–5 mm. long; disk glabrous, 2.5–3.5 mm. wide; style 8–10 mm. long; stamens about 125; petals broad, nearly glabrous, ciliate, up to about 8 mm. long; ovary bilocular, the ovules about 12 in each locule, in a subcapitate group from near the middle of the central partition; fruit probably oval-oblong and about 2–2.5 cm. long.

Eugenia Karwinskyana Berg, Linnaea 29: 244. 1858. *Eugenia tabascensis* Lundell, Phytologia 1: 482. 1941.

Wet or dry forests, at about 1500 meters; Alta Verapaz (region of Chelac, northeast of Carchá, *Standley* 70388). Mexico (San Luis Potosí; Hidalgo, Huejutla, *Karwinsky* 242, the type; Tabasco, Tenosique, *E. Matuda* 3561, type of *E. tabascensis*).

Shrub or small tree, rather generally antorsely appressed-pubescent or strigose, with sordid or silvery simple hairs 0.3–0.5 mm. long; leaves finally glabrate, ovate or elliptic, 1.5–3.5 cm. wide, 5–11 cm. long, (2.6–) 3–4 times as long as wide, gradually long-acuminate, the tip obtuse; base acute to cuneate, the margins decurrent on the inner angles of the petiole 3–5 mm. long; midvein sharply and rather narrowly impressed above, the furrow persistently short-hispid; lateral veins rather close and parallel, 12–20 on each side including some intermediate ones, arching-ascending, scarcely apparent above in mature leaves, convex but inconspicuous beneath; marginal vein about equaling the lateral ones and arched between them, 0.5–1 mm. from the margin; blades dark green and lustrous above, paler beneath; leaves gland-dotted, the glands usually appearing as scattered resinous convexities on the lower surface, more frequent above, where dark or translucent, or the older leaves impressed-punctate; inflorescences racemose, 2–4 cm. long [or some flowers solitary in the lowermost (bracteate) axils of leafy branchlets], the axis dorsiventrally compressed, 1–1.5 mm. wide at base, bearing 4–5 (–9) pairs of flowers on pedicels 4–7 mm. long, 0.2–0.4 mm. thick, the terminal flower often present also; bracts persistent, convex on the back, ovate to lanceolate, 0.5–2 mm. long, the distal ones longer and narrower; bracteoles broadly ovate-deltoid, convex on the backs, somewhat coherent by their proximal margins and closely investing the base of the hypanthium, acuminate and sharp-pointed, 1.3 mm. long, thinly strigose and contrasting with the densely strigose, canescent hypanthium; buds 2.5 mm. long, pyriform, the campanulate hypanthium more than 1 mm. long; calyx-lobes rounded-ovate, strigose without, closely silvery-silky within, the larger ones 1.5 mm. wide, 1.7 mm. long; disk 1.5 mm. wide, hairy; style 4.5–5 mm. long; stamens 50–60, about as long as the style, the anthers 0.4 mm. long; petals about 3 mm. long, white; ovary bilocular, the ovules 5 in each locule; fruit black or reddish black, depressed-globose, about 1 cm. in diameter.

This species is certainly closely related to *E. biflora* and is perhaps not specifically distinct. From other known Central American representatives of *E. biflora*, *E. Karwinskyana* is distinguished by having the leaves mostly elliptic (not lanceolate as is usual in *E. biflora*), slender-pointed but not bristle-tipped, and obscurely if at all impressed-punctate. The flowers are usually 8–10 in each raceme, as against the usual number of about 6 (–8) in *E. biflora*; other distinctions are noted in the key.

***Eugenia laevis* Berg, Linnaea 27: 177. 1856.**

A shrub or small tree up to 10 meters high and 6–8 cm. in diameter, soon glabrate, the youngest branchlets and the inflorescence silky-pubescent with loosely attached short-stalked somewhat appressed equally 2-branched lustrous pale yellow-white or reddish hairs 0.2–0.5 mm. long; petioles, and branchlets of the current season sometimes minutely hispidulous; plants usually nearly glabrous at flowering time except the inflorescence; leaves coriaceous, rather small, ovate (sometimes narrowly so) to elliptic or obovate, about 7.5 cm. long or usually less, acute or usually cuneate at base, the thick and often revolute margins decurrent on the dilated summit of the channeled petiole; midvein rather sharply impressed above; lateral veins 5–10 on each side, stronger than the few intermediate ones, obscure

above, more evident beneath; marginal vein about equaling the lateral ones and arched between them, 0.5–2 mm. from the margin; blades strongly disolorous, the upper surface lustrous and minutely verruculose (or dotted) with innumerable pale convex elevations much smaller and more numerous than the few (if any) translucent glands; lower surface paler, often drying brown or yellow-green, usually with some translucent convex glands; inflorescence a very short axillary raceme (or 2–3 racemes superposed), or some of the flowers solitary and opposite at the lowermost (bracteate) nodes of a new leafy shoot; raceme-axis 1–3 (–5) mm. long, bearing 1–4 opposite decussate pairs of flowers on slender pedicels (2–) 3–8 (–13) mm. long, up to 0.5 mm. thick in fruit; bracts 1 mm. long or less, ovate, somewhat persistent-indurate; bracteoles persistent, not connate, ascending, somewhat glandular-thickened at base, 1 mm. long or less; buds 2.5–4 mm. long, pyriform, the campanulate hypanthium usually densely and conspicuously pale-pubescent, 1–1.5 mm. long; calyx-lobes in unequal pairs, concave in flower and in fruit, ovate, densely silky-pubescent near the apices and sometimes on as much as the distal one-third of both surfaces, but otherwise merely strigose without and glabrous within, the larger ones 1.5–2.7 mm. long, 1.5–2 mm. wide; disk 1.5–2 mm. wide; style (4–) 5–6 mm. long; stamens 75–100, about as long as the style, the anthers up to 0.7 mm. long; petals white, suborbicular, 2.5–5 mm. long; ovary bilocular, the ovules about 8 (5–10) in a compact group in each locule; fruit globose to ovoid or pyriform, probably black, tipped by the persistently concave calyx lobes.

Represented in Guatemala and British Honduras by two varieties distinguished as follows:

Leaves mostly 4.5–6.5 cm. long, acuminate; petioles 5–8 mm. long; fruit 7–8 mm. in diameter, as far as known not stipitate.....var. *laevis*.

Leaves mostly 5 cm. long or less, if longer often rounded or broadly and obscurely acuminate at tip; petioles 2.5–5 mm. long; fruit 5–6 (–8) mm. in diameter, usually contracted at base to a slender stipe 1–2 mm. long.
var. *Gaumeri*.

Eugenia laevis Berg, var. *laevis*. *E. subverticillaris* Berg, Linnaea 29: 235. 1858. *E. calciphila* Lundell, Wrightia 3: 11. 1961.

Well-drained upland forest of *Brosimum (ramonal)*; Petén (Dos Lagunas, *E. Contreras* 1541, type of *E. calciphila*). Yucatán; Hispaniola, the type region.

Leaves ovate or ovate-elliptic, 2.5–4 cm. wide, about 1.6–2 times as long as wide, the tip bluntly acuminate or sometimes obtuse.

The only known Guatemalan collection is the type of *Eugenia calciphila*. This is a specimen in bud, with a few open flowers. It is only sparingly pubescent in the inflorescence, but otherwise agrees precisely with specimens from Yucatán and from Hispaniola.

Eugenia laevis Berg, var. **Gaumeri** (Standl.) McVaugh, Fieldiana, Bot. 29: 469. 1963. *E. Gaumeri* Standl. Field Mus. Bot. 8: 28.

1930. *E. Lundellii* Standl. Carnegie Inst. Wash. Publ. 461: 76. 1935.
Guayabillo.

Dry rocky thickets or scrub forest with *Haematoxylum (tintal)*, sometimes in pine-oak forest, mostly at low elevations; Petén; Baja Verapaz (north of Santa Rosa, 1500 meters, Standley 69775). Yucatán, the type from Kancabtsonot, Gaumer 23843; Campeche (Tux-peña, Lundell 1130, the type of *E. Lundellii*); British Honduras; Honduras.

Leaves elliptic or lance-ovate, to elliptic-lanceolate, oblanceolate or obovate, 1-3 (-4) cm. wide, 1.5-2.3 (-2.7) times as long as wide, obtusely pointed, or rounded, or broadly and bluntly acuminate.

For a note on the taxonomy of this variety, see Fieldiana, Bot. 29: 469. 1963. The cited collection from Baja Verapaz is sterile, but agrees well in pubescence and in leaf-form with Yucatán material.

A very similar species, *Eugenia coyolensis* Standl. (Field Mus. Bot. 9: 320. 1940) is known only from the Department of Yoro, Honduras, the type from Coyoles, Yuncker et al. 8069. This may not be specifically distinct, but seems superficially different; the leaves are obovate, rounded or broadly obtuse at apex; the flowers are somewhat larger than those of *E. laevis* (the larger calyx-lobes 2.5-3.5 mm. wide, the stamens about 125).

***Eugenia lancetillae* Standl.** Field Mus. Bot. 4: 317. 1929.

Known only from the type, Honduras, Dept. Atlantida, wet forest, Lancetilla Valley near Tela, 20-600 meters, Standley 53301.

Tree 6-7 meters high, the branchlets, petioles, inflorescence and veins of the lower leaf-surface hispidulous with pale short brown hairs; leaves thin, elliptic, 4-8 cm. wide, 12-19 cm. long, 2.5-3 times as long as wide, short-acuminate, narrowed and rounded to the base, the margins finally cuneately decurrent on the channeled petiole 8 mm. long, 1.5-2 mm. thick; midvein flat above; main lateral veins about 8 on each side, seen above as pale somewhat depressed convex lines, prominent beneath, arcuate-ascending, scarcely forming a marginal vein, often diminishing distally, recurving 5-7 mm. from the margin and joining the next succeeding veins; intermediate lateral veins scarcely developed, the small veinlets forming a prominent network; blades probably dull above, paler beneath, the glands hardly apparent; inflorescence a crowded axillary raceme, the axis in fruit up to 3 mm. long, 1.5 mm. thick, bearing 1-3 pairs of nearly sessile flowers; bracts persistent, indurated, broadly rounded, 1 mm. long; bracteoles persistent, distinct, ovate-orbicular, 1-1.3 mm. broad and long; calyx-lobes in fruit in unequal pairs, the larger ones up to 2.5-3 mm. wide, 3 mm. long, orbicular-ovate, the shorter ones deltoid-ovate, 2.5 mm. wide, 2 mm. long; disk hirsute, 2.5 mm. wide; immature fruit ellipsoid-oval, 1 cm. in diameter, 1.3 cm. long.

Eugenia letreroana Lundell, Wrightia 3: 15. 1961.

To be sought in Guatemala; known only from the type collection, Matuda 4336, from Letrero, near Siltepec, Chiapas, in virgin forest at 2000 meters elevation.

A tree 3-4 meters high, the inflorescence and young branchlets and petioles minutely puberulent; leaves narrowly elliptic, 1-1.8 cm. wide, 3-6 cm. long, 2.5-3.5 times as long as wide, about equally narrowed to the slenderly but bluntly acuminate tip and to the acute or cuneate base, the margins decurrent on the inner angles of the deeply channeled petiole 4-6 mm. long; midvein pale, deeply incised in the plane opaque surface of the blade; lateral veins 5-8 on each side, obscure above, inconspicuous beneath, connected by irregularly angled arches, the marginal vein scarcely developed; blades dull dark green and almost featureless above, when dry strongly discolored, brown and finely dark-dotted beneath; inflorescence a well-developed raceme, the axis 4-9 mm. long, 4-angled and 1 mm. thick at base, bearing (4-) 6-8 opposite and decussate pairs of flowers on pedicels 1-1.5 mm. long; bracts divaricate, subpersistent, indurate, 0.5 mm. long; bracteoles ovate, rounded on the backs, persistent but scarcely connate, 0.5 mm. long; buds obovoid-pyriform, 2.5 mm. long, the globe of the petals much exceeding the calyx; hypanthium puberulent, campanulate, 1 mm. long, prominently dotted with convex yellowish glands; calyx-lobes broadly rounded, the larger ones 1 mm. wide, 0.7 mm. long; disk 1.3-1.8 mm. wide; style about 4.5 mm. long; stamens about 75; petals white, suborbicular, 3 mm. long; ovary bilocular, the ovules about 9 in a compact group in each locule; fruit unknown.

Eugenia Matudae Lundell, Phytologia 1: 218. 1937. *Stink-yá* (Huehuetenango, according to Steyermark).

A species of forested mountains, along rivers, to be expected in Guatemala. Chiapas, the type from Mt. Madre Vieja, E. Matuda 648.

A tree 5-6 meters high, known only from over-mature fruiting specimens, the whole plant at this stage glabrous; leaves elliptic, about equally narrowed to a short blunt acumen and an acute base, 6.5-8 cm. wide, 14-18 cm. long, 2.3-2.7 times as long as wide, the margins cuneately decurrent on the channeled petiole 1.3-2 cm. long; midvein rather broadly concave above, the central channel bordered by parallel convex ridges; lateral veins 6-8 on each side, arcuate-ascending, much stronger than the intermediate ones if any, convex on both sides of the blade, diminishing distally and arching over 5-6 mm. from the margin to join the next succeeding ones, the marginal vein not well defined; leaves nearly concolorous, probably paler beneath, with small convex glands on both surfaces; flowers apparently several together in sessile clusters at leafless nodes on old wood, arising from a short woody spur probably consisting of the fused axes of 2-3 very short superposed racemes; pedicels in fruit 1.3-3 cm. long, 1.3-1.7 mm. thick; bracteoles persistent under the fruit, distinct, indurated, deltoid, 1.5 mm. long and wide; fruit glandular-verrucose, glabrous, broadly ellipsoid or obovoid to nearly globose, rounded at both ends, 1.5-2.3 cm. thick, 2-2.5 cm. long, surmounted

by the concave, broadly rounded calyx lobes; lobes in unequal pairs, the larger ones 5 mm. wide at base, 6 mm. long; disk about 6 mm. wide.

This species much resembles *E. choapamensis* Standl., from which it may be superficially distinguished by the much wider staminal disk, the larger fruit, and the smaller number of foliar veins.

The specific epithet was originally spelled *Matudai*. According to the International Code of Botanical Nomenclature this is orthographically incorrect; the preferred spelling is *Matudae*, regardless of the sex of the person for whom the species is named.

***Eugenia nigrita* Lundell, Wrightia 3: 16. 1961.**

To be sought in Guatemala; known only from the type locality, near Siltepec, Chiapas, where collected in advanced forest at 1600 meters elevation (*Matuda* 5183, the type).

A tree up to 10 meters high, darkening in drying, nearly glabrous, the young branchlets and vegetative buds and the inflorescence more or less covered with rather coarse lustrous simple copper-colored hairs up to 0.5 mm. long or more, the whole plant soon glabrate; leaves broadly elliptic or elliptic-ovate, 1.5–2.8 cm. wide, 3–6 cm. long, 2–2.3 times as long as wide, prominently acuminate (the very tip obtuse), acute to cuneate at base, the margins decurrent on the inner angles of the deeply channeled petiole 4–7 mm. long; midvein narrowly impressed above; lateral veins about 5, inconspicuous above and a little more evident beneath, connected by irregularly arching or branching subordinate veins, the marginal vein scarcely developed; blades rather thin, darker and often with gland-filled convexities above, the lower surface paler (brown in drying), eglandular or finely dark-dotted; inflorescence an abbreviated raceme (or the flowers opposite at the lowermost [bracteate] nodes of new leafy branchlets), the axis of the raceme often 3–5 mm. long, bearing up to 4 pairs of flowers on pedicels 1.5–2 mm. long; bracts ovate, indurate, up to 0.8–1 mm. long; bracteoles broadly ovate, divaricate, thickened at base and persistent but scarcely connate, 1 mm. long, coarsely hairy without or at least apically fringed; buds pyriform, 3–4 mm. long including a contracted broadly stipelike base; hypanthium campanulate, 1–1.3 mm. long, glabrous or sparingly strigose; calyx-lobes membranous, flat, fringed, hemi-orbicular, the larger ones 1.5 mm. wide, 1.2 mm. long; disk about 1.5 mm. wide; style 5–6 mm. long; stamens about 75, about as long as the style, the anthers about 0.5 mm. long; petals white, suborbicular, 3 mm. long; ovary bilocular, the ovules about 15 in a compact group in each locule; fruit globose or oblate, probably black, 1.3 cm. in diameter.

***Eugenia octopleura* Krug & Urb. ex Urb. Bot. Jahrb. 19: 653. 1895. *E. Doubledayi* Standl. Journ. Arnold Arb. 11: 36. 1930 (Honduras, the type from Siguatepeque, Standley 56063). *E. Koepperi* Standl. Field Mus. Bot. 9: 320. 1940 (Honduras, the type from Mt. Cangrejal near La Ceiba, Yuncker et al. 8400).**

Thickets and river banks, or wet forest, mostly at low elevations, in Honduras up to 1500 meters; Petén (Dolores, km. 85, Machaquila Road, E. Contreras 2953). Honduras; Costa Rica; Lesser Antilles.

Tree or shrub 3–6 meters tall, up to 20 cm. in diameter, appressed-pubescent but glabrate, the inflorescence densely and closely beset with yellowish-white to pale brown or rufous dibrachiate hairs, the branchlets and petioles and lower leaf-surfaces with very fine numerous pale hairs; leaves elliptic-ovate, 3–5 (–6.5) cm. wide, 7–10 (–15) cm. long, 2–3 times as long as wide; blades prominently acuminate at tip, acute or somewhat rounded at base, the margins somewhat cuneately decurrent on the inner angles of the channeled petiole 8–15 mm. long, 1–1.5 mm. thick; midvein impressed above; lateral veins 8–12 pairs, ascending, rather inconspicuous above, more prominent beneath, stronger than the intermediate veins if any, distally forming strong irregular interconnecting arches 1.5–5 (–10) mm. from the margins; glands inconspicuous; inflorescences rather stout clustered axillary racemes (usually 2–3 superposed) 1.5–2.5 cm. long, the axis 1–1.8 cm. long, bearing 3–4 opposite and decussate pairs of flowers; terminal flower abortive; pedicels 3–9 mm. long, 0.5 mm. thick in flower; bracts ovate, acute, 1 mm. long, rounded on the backs, becoming dark and indurated and probably falling after anthesis; bracteoles similar, distinct, persistent through anthesis; buds 3–5 mm. long, pyriform; hypanthium ridged at anthesis when dry, conic, 1.5–2 mm. long; calyx-lobes in unequal pairs, broadly rounded, glabrate without, thickly appressed pubescent with rufous hairs within, the smaller (outer) pair 1.5–2 mm. long, 2.5 mm. wide, the larger pair 2.5–3 mm. long, 3.5–4 mm. wide; disk 2.5–3 mm. wide, with a few long hairs about the style, the staminal ring somewhat pitted; style 5–7 mm. long; stamens 125–150, up to 5 mm. long, the anthers 0.6 mm. long; petals white, 4–5 mm. long; ovary bilocular, the ovules ca. 10–16 in each locule, radiating in a subcapitate group from the central dissepiment; immature fruit oblong or obovoid-oblong, crowned by the persistent calyx-lobes, obtuse at apex, narrowed a little toward the base, 8-ribbed, 6–7 mm. thick, 16–18 mm. long, minutely pale pubescent, subtended by the persistent divaricate bracteoles.

Evidently very closely related to *E. pleurocarpa* Standl., of western Mexico, but differing in the relatively narrower and more prominently acuminate leaves, the more closely appressed pubescence, the more strongly proliferous inflorescence.

Eugenia Oerstedeana Berg, Linnaea 27: 285. 1856. *E. vincentina* Krug & Urb. ex Urb. Bot. Jahrb. 19: 621. 1895. *E. Conzattii* Standl. Contr. U. S. Nat. Herb. 23: 1041. 1924. *E. cocquericotensis* Lundell, Bull. Torrey Club 64: 554. 1937. *E. petenensis* Lundell, Bull. Torrey Club 69: 397. 1942. *E. eutenuipes* Lundell, Wrightia 2: 106. 1960. "Jolteillo" (Petén, according to Lundell).

Moist or wet thickets or mixed forest, sometimes in pine forest, mostly 1200 meters or less, most frequent at rather low elevations; Petén (La Libertad, Lundell 3746, type of *E. petenensis*); Izabal; Santa Rosa; Escuintla; Guatemala; Sacatepéquez; Chimaltenango;

Sololá; Retalhuleu; Quezaltenango; Huehuetenango. Mexico (north to Nayarit and northern Veracruz; Oaxaca, *Conzatti et al.* 3113, type of *E. Conzattii*; Tabasco; Chiapas, Siltepec, *Matuda* 411, type of *E. eutenuipes*); British Honduras (Little Cocquericot, El Cayo District, *C. L. Lundell* 4090, type of *E. cocquericotensis*); Central America as far east as Costa Rica, the type from Nicaragua, between Sapoá and Tortuga, *Oersted*; West Indies (St. Vincent).

A shrub or small tree 3–6 meters high, up to 15 cm. in diameter; leaves nearly glabrous from the first, but the vegetative buds and youngest growth appressed-pubescent with evanescent partly dibrachiate coppery hairs up to 0.4 mm. long, and the petioles and a narrow zone on the upper leaf-surface along the midvein persistently hispidulous with sharp erect colorless hairs 0.1–0.2 mm. long; branchlets similarly hispidulous, often glabrate; pedicels and flowers nearly glabrous; leaves chartaceous or membranaceous, ovate to elliptic or broadly lanceolate, (1.8–) 2.5–4 cm. wide, 4–9 cm. long, (1.75–) 2–3 (–3.5) times as long as wide, the apex acuminate, the base rounded or acute, sometimes slightly inaequilateral, the margins more or less cuneately decurrent on the deeply channeled petiole 4–7 mm. long; midvein deeply and narrowly impressed above, often elevated its whole diameter beneath, and bearing a few coppery dibrachiate hairs; lateral veins slender, 6–10 pairs in addition to some intermediate ones, curving-ascending, more conspicuous and convex below, seen above as a fine and often slightly incised line; marginal vein about equaling the laterals and arched between them, well separated (2–5 mm.) from the margin, and paralleled by a thinner continuous, submarginal vein near the margin; surfaces of the blade dull, pale or brownish green and nearly concolorous when dry, the glands scarcely apparent, or a few scattered on the lower surface; inflorescence variable, the flowers often solitary in the axils of ordinary leaves or of small lanceolate scarious deciduous bracts, or about equally often in slender axillary racemes 1–2.5 (–4) cm. long, less than 1 mm. thick at base, bearing up to 5–6 opposite or subopposite and decussate pairs of flowers on very slender, sometimes hispidulous pedicels 6–10 (–25) mm. long, about 0.3 mm. thick; terminal flower often present; bracteoles scarious, thin-margined, persistent, with prominent convex glands near base, broadly ovate-cordate but not contiguous, up to 1.5 mm. long and wide; buds 4–4.5 mm. long, glabrous or essentially so except the ciliate perianth-segments; hypanthium cup-shaped; calyx-lobes membranaceous, scarious, prominently gland-dotted, in slightly unequal pairs, broadly rounded, up to 1.5–2 mm. long, 2–2.5 mm. wide; disk 1.5–2.5 mm. wide; style 5 mm. long; stamens 60–75, about as long as the style; anthers 0.5 mm. long; petals white, prominently glandular, 4 mm. long; ovary bilocular, the ovules 2–6 in each locule, collateral or two-ranked; fruit sessile, globose, glandular-roughened, 8–10 mm. in diameter, tipped by the pale membranaceous calyx-lobes; seed usually 1, the embryo undivided.

One of the commonest species of *Eugenia* in Guatemala, widely distributed and uniform in most of its characters. It has been reported from Guatemala, and from British Honduras, as *E. vincentina* Krug & Urban. Taxonomically *E. Oerstedeana* appears to be closely allied to *Eugenia florida* DC., a widely distributed lowland species



FIG. 51. *Eugenia Oerstedeana*. A, flowering branchlet; \times ca. 0.8. In this species the inflorescence may be an elongate raceme, a 3-flowered raceme with the terminal flower present (simulating a dichasium), or a leafy branch having the individual flowers subtended by small bracts or even by ordinary leaves. Each node in the inflorescence is at right angles to the one below it, and a similar arrangement is carried through into the flower: B, Lateral view of flower, cut away to show the orientation of the ovules. The bracteoles beneath the flower alternate with the outer (shorter) calyx-lobes, and thus are opposite the inner pair of lobes. C, Flower seen from below, the hypanthium and ovary cut away to show the orientation of the locules of the ovary. The locules are opposite the outer calyx-lobes, hence alternate with the inner pair of calyx-lobes and with the bracteoles.

of northern South America and Panama. In *E. florida* most of the flowers are in racemes bearing 4–5 (or up to 10) pairs of flowers on short pedicels 3–4 mm. long or less. The type of *Eugenia cocquericotensis* answers this description; it is among the few Central American specimens of *E. Oerstedeana* that closely resemble *E. florida*. For notes on the taxonomy of *E. Oerstedeana*, see Fieldiana, Bot. 29: 446–448. 1963.

***Eugenia organoides* Berg**, Linnaea 29: 229. 1858. *E. conglobata* Sessé & Moc. Naturaleza II. 1: app. 83. 1888. *E. Banghamii* Standl. Journ. Arnold Arb. 11: 125. 1930.

Moist or wet, mixed forest or thickets, frequently in pine forest, often on limestone, sometimes in rather dry places, 1500 meters or less; Alta Verapaz; Izabal; Zacapa; Retalhuleu; Huehuetenango. Eastern Mexico (north to Tamaulipas, Palmer 295 in 1910; Papantla, Veracruz, Karwinsky 238, the type). British Honduras; Costa Rica; Panama; Colombia (*Triana*).

Tree or shrub up to 6 meters high, usually densely tawny-hirsutulous on branchlets and inflorescence, and somewhat less densely on the lower leaf-surfaces, with erect or curved lustrous hairs about 0.5–1 mm. long; leaves elliptic, (1–) 2–3 (–6) cm. wide, (3–) 4–10 cm. long, (1.6–) 2–3 times as long as wide, abruptly or gradually narrowed to the pointed or somewhat bluntly acuminate tip, narrowed below the middle and rounded or often acute at base, the margins passing abruptly into the sulcate hirsute petiole 3–4 mm. long, 1–2 mm. thick including the hairs; midvein impressed and persistently hirsutulous above, prominent beneath; lateral veins about 6–10 pairs with some intermediate veins almost as strong, slightly elevated in drying but inconspicuous or scarcely apparent above, evident beneath, nearly straight and passing directly into the marginal vein, which is about as strong as the laterals and arched between them, 2.5–5 (–8) mm. from the margin; blades dark in drying, strigose and often otherwise almost featureless above, non-glandular, paler beneath and sometimes finely dark-dotted; flowers closely glomerate, the inflorescence a group of abbreviated axillary racemes; axis of each raceme up to 4 (–7) mm. long, bearing up to 5 approximate and decussate pairs of flowers on pedicels 1–1.5 mm. long or less; bracts rounded-deltoid, about 0.7 mm. long and wide, glabrous on the inner surface, the outer thickly velutinous with hairs 0.5 mm. long; bracteoles persistent, distinct, ovate, acute, setose like the bracts, 0.5–1 mm. long; buds ca. 2.5 mm. long; hypanthium subglobose, about 1–1.3 mm. long and wide, sparingly to very densely pilose; calyx-lobes 4, membranous, glabrous or sparingly setose, long-ciliate, gland-dotted, rounded-ovate, about as long as the hypanthium, 1–2 mm. wide and long; disk flat, glabrous or hairy at the center, about 1–1.5 mm. wide; style 5.5–7 mm. long; stamens about 35–60, up to 5–6 mm. long, the anthers 0.2–0.4 mm. long; petals obovate, glabrous, 2.5 mm. wide, 4 mm. long; ovary bilocular, the ovules 4–5 or up to 9–10 in each locule, radially attached to a short placenta near the center of the central partition; fruit subglobose, 6–8 mm. in diameter, first red then finally black, sparingly pubescent, finally glabrate.

An imperfectly known species, *Eugenia rubella* Lundell, Wrightia 3: 18. 1961 (the type from Petén, Dolores, E. Contreras 2559) closely resembles *E. origanoides* except that the pedicels are up to 4 mm. long. Similar plants are known from the *llanos* of the Isthmus of Tehuantepec, in Oaxaca. These specimens may represent some abnormality in *E. origanoides* or may perhaps be of hybrid origin.

***Eugenia ovandensis* Lundell, Wrightia 3: 17. 1961.**

To be sought in Guatemala; known only from the type collection, Matuda 1834, from Mt. Ovando, Chiapas.

A small tree, the branchlets, petioles and inflorescence hispidulous-puberulent with small erect hairs; leaves elliptic or elliptic-ovate, 2–3 cm. wide, 4–6 cm. long, 2–2.3 times as long as wide, bluntly acuminate, acute or rounded at base, the margins decurrent on the channeled petiole 4–6 mm. long; midvein channeled above in the plane surface of the blade; lateral veins 5–8 on each side, inconspicuous on both surfaces, connected by irregularly angled arches 2–4 mm. from the margin but a marginal vein scarcely developed; somewhat immature foliage darkening in drying, the leaves glossy above, nearly concolorous, dull beneath, the internal glands apparent as convexities on both surfaces; inflorescence an abbreviated raceme (or the flowers opposite at the lowermost [bracteate] nodes of new leafy branchlets), the axis of the raceme up to 4–5 mm. long, bearing up to 4 pairs of flowers on slender pedicels 3–5 mm. long; bracts ovate, indurate, 0.5 mm. long; bracteoles ovate, divaricate, rounded on the backs, persistent but scarcely connate, 0.5 mm. long, forming a 2-lobed involucre 1 mm. wide; buds pyriform, 3.5 mm. long; hypanthium hispidulous like the pedicels, turbinate-campanulate, stipitate and standing above the bracteoles, the expanded part 1 mm. long; calyx-lobes in unequal pairs, broad and low, often partly reflexed at anthesis, glabrous within except near the ciliate margin, the smaller ones 1 mm. wide, the larger ones 1.5 mm. wide, 1 mm. long; disk 1.3 mm. wide; styles 5–6 mm. long, puberulent below the middle; stamens 60–75, up to 5 mm. long, the anthers 0.5 mm. long; petals white, obovate, 2.5 mm. long; ovary bilocular, the ovules about 4 in each locule; fruit unknown.

***Eugenia pachychlamys* Donn. Sm. Bot. Gaz. 27: 333. 1899.**
E. chiquimulana Standl. & Steyermark. Field Mus. Bot. 22: 358. 1940
(type from summit of Volcán de Quezaltepeque, Steyermark 31453).
Guayabillo.

Moist or wet, broad-leaf forests, brushy hillsides, dry cleared slopes, 1100–2150 meters; Chiquimula; Jalapa; Santa Rosa; Guatemala (type from Fraijanes, Heyde & Lux 3061). El Salvador (Dept. Chalatenango, Tucker 1204).

A compact shrub 1–2 meters high, or a tree up to 6 meters, densely rufous-tomentose, the branchlets, petioles, inflorescences and youngest leaves quite obscured by a mat of contorted hairs up to 1 mm. thick; leaves elliptic to ovate or obovate, about equally narrowed to both ends, broadly short-acuminate, rounded

or acute at base, 2.5–5 cm. wide, 5–12 cm. long, 2–2.7 times as long as wide, the margins passing abruptly into the petiole 10–15 mm. long and 2–2.5 mm. thick including the hairs; midvein impressed above, tomentose; lateral veins 7–9 on each side, slightly elevated on both sides when dry; marginal vein weaker than the laterals, forming a series of angular arches 2–6 (–10) mm. from the margin; blades opaque, dark green and lustrous above, reticulate-veiny, beneath paler ("silver green" according to Steyermark) and drying brown, tardily glabrescent and finely gland-dotted; flowers large and nearly sessile in crowded axillary glomerules, usually one pair only on an abortive axis 1–5 mm. long; bracteoles ovate, 3–5 mm. long, deciduous at anthesis; buds 8–10 mm. long, pyriform; calyx-lobes ovate-orbicular, 6–8 mm. long and wide, tomentose on both sides; disk 5 mm. wide, tomentose at the center; style 12 mm. long; stamens about 200, up to about 12 mm. long; petals nearly glabrous, white; ovary bilocular, the ovules in a compact group of about 10 in each locule; fruit hard, tomentose, globose to oval or obovoid, 1.7–2.5 cm. in diameter, 2–3 cm. long (in 2-seeded fruits sometimes didymous, 4 cm. wide).

In the protologue the number of the type collection was cited as 3961, but on the labels it is 3061.

Fine specimens of this species exist among the collections of Sessé & Mociño; these were presumably collected by Mociño during his long sojourn in Guatemala from about 1796 to 1798 (cf. *Chronica Botanica* 11: 37–38. 1947), and so must be among the oldest of all known specimens of Guatemalan plants.

Eugenia papalensis Standl. & Steyermark. *Field Mus. Bot.* 23: 130. 1944. *Guayabillo*.

Known only from the type, Dept. Huehuetenango, Cumbre Papal, between the summit and La Libertad, 1800–3000 meters, Steyermark 50964.

A tree 10–11 meters high, glabrate at maturity but the mature branchlets hispid with pale coarse erect hairs up to 0.5 mm. long, the young herbage and inflorescence probably hispidulous or appressed-pubescent with pale or reddish hairs; leaves when dry rigid and leathery, broadly elliptic-ovate, 6–8 cm. wide, 12–15 cm. long, 2–2.4 times as long as wide, apparently blunt-tipped, rounded at base, the thick revolute margins abruptly decurrent on the sparingly hispid channeled petiole 12–15 mm. long, 2–2.5 mm. thick; midvein concave and somewhat depressed above, sometimes persistently hispidulous; lateral veins about 10 on each side in addition to some intermediate ones, seen as pale lines above, more prominent beneath; marginal vein about equaling the lateral ones and arched between them, 3–4 mm. from the margin; blades "deep green above," paler beneath, the glands inconspicuous; flowers probably in sessile axillary clusters, not seen; pedicels in fruit 1 mm. long and 2 mm. thick; bracteoles persistent, broadly rounded, hispid, 2 mm. wide, 1 mm. high; fruit "pale yellow," glandular-verrucose, "bitter," globose or a little elongate, 1.7–2.2 cm. in diameter, about 2 cm. long, crowned by the subsessile calyx-lobes, these finely pubescent inside, the larger ones 3–4 mm. long and wide; disk 3–3.5 mm. wide.

Eugenia Percivalii Lundell, Wrightia 2: 124. 1961.

British Honduras: Toledo District, Edwards Road beyond Columbia, in high ridge, hilltop near Central Camp, *P. H. Gentle* 7332, type. Known only from the type collection.

A tree 20 cm. in diameter, nearly glabrous, the inflorescence minutely puberulent with erect or ascending pale hairs 0.1 mm. long or less; leaves coriaceous, elliptic, 2.5–5.5 cm. wide, 8–13 cm. long, 2–3 times as long as wide, about equally narrowed to a blunt or sometimes obscurely acuminate tip and to the rounded or acute base, the margins cuneately decurrent on the channeled petiole 8–10 mm. long, 1.5–2 mm. thick; midvein nearly flat or sulcate above; lateral veins about 10 pairs, apparent on both sides of dried leaves but inconspicuous, a little stronger than the intermediate ones; marginal veins about equaling the lateral ones and arched between them, 1.5–2.5 mm. from the margin; blades smooth and glossy green above, paler and finely dark-dotted beneath; flowers clustered in the axils, the inflorescence a very short axillary raceme (sometimes a second raceme superposed), the angular axis 1 mm. thick at base, 1–3 mm. long, bearing 1–4 approximate, decussate and opposite pairs of flowers on pedicels 1–2 mm. long, 0.5 mm. thick, the terminal flower abortive; bracts scarious, persistent, ovate, broad-based, 0.7 mm. long; bracteoles persistent, ovate, somewhat flaring, 0.5–0.6 mm. long, not coherent, thickened at base and convex dorsally, puberulent; buds [about 3 mm. long], pyriform, the campanulate hypanthium puberulent; calyx-lobes 4, in unequal pairs, concave, broadly rounded, sparingly puberulent without, minutely appressed-puberulent within, the larger ones up to 3 mm. wide, 2.5 mm. long; disk 2–2.5 mm. wide, bearing a few hairs around the base of the style, the staminal ring somewhat bristly; style about 6 mm. long; stamens about 100; petals white; ovary bilocular, the ovules 5–6 in each locule, in a compact group on the central dissepiment; fruit unknown.

Eugenia Rekoi Standl. Contr. U. S. Nat. Herb. 23: 1044. 1924.

Deciduous forest near the Pacific Coast, rocky headlands, low wooded hills, thickets near the beach, 300 meters or less; Quezalteango (Caballo Blanco, *J. D. Smith* 1485). Mexico (Sinaloa to Oaxaca, the type from Cafetal Apango [Cerro Huatulco], *B. P. Reko* 3356).

A tree up to 10 meters high, 15–20 cm. in diameter, the inflorescence and young growth densely appressed-pubescent with coppery dibrachiate hairs mostly 0.2–0.3 mm. long, the youngest branchlets and foliage often reddened by the hairs, the leaves soon glabrate or rather persistently appressed-pubescent with nearly colorless hairs; blades broadly elliptic, varying to ovate or obovate, 2–4 cm. wide, 3–5 (–7) cm. long, 1.6–2.5 times as long as wide, the tip prominently or obscurely acuminate or on short branchlets obtuse, the base cuneate or somewhat rounded, the margins always cuneately long-decurrent on the dilated summit of the petiole 4–6 mm. long; midvein sulcate above; lateral veins 5–7 on each side, ascending, obscure above, evident beneath, connected by irregularly angled arches 2–3 mm. from the margin, the marginal vein often not well developed; blades dark green and glossy and usually minutely glandular-verruculose above, paler and finely

gland-dotted beneath; inflorescence a very short axillary raceme (usually with 1–2 additional shorter racemes superposed), the axis up to 4 mm. long with 1–3 pairs of flowers on pedicels 1.5–3 (–5) mm. long; bracts ovate, 0.5 mm. long; bracteoles persistent, convex, distinct, ovate-triangular, 0.5–0.7 mm. long; buds pyriform, about 2 (–3) mm. long; hypanthium campanulate or obovoid, 1 (–1.5) mm. long; calyx-lobes broadly rounded, membranous, appressed-pubescent on both surfaces, the larger ones 1.5–2 mm. long and wide; disk 1.3–1.7 (–2) mm. wide; style 4–4.5 mm. long; stamens about 50, about as long as the style; petals white, up to 3 mm. long; ovary bilocular, the ovules 6–8 in each locule; fruit glabrous, glandular-verrucose, black, oblong or narrowly obovoid, obtuse at both ends, 7–8 mm. in diameter, 9–13 mm. long, with very thin flesh.

This species is rather abundant and uniform along the Mexican coast from Oaxaca westward. The single known Guatemalan collection seems to have thinner and relatively narrower leaves and somewhat longer pedicels than most Mexican specimens, but probably belongs to the same species.

Eugenia rhombea (Berg) Krug & Urb. ex Urb. Bot. Jahrb. 19: 644. 1895. *E. foetida* γ *rhombea* Berg, Linnaea 27: 212. 1856. ?*E. fiscalensis* Donn. Sm. Bot. Gaz. 54: 235. 1912. ?*E. leptopa* Lundell, Bull. Torrey Club 69: 396. 1942.

In deciduous forest and scrub, at or near sea level, or on rocky hillsides, 700–1500 meters; Petén; Baja Verapaz; Guatemala (Fiscal, C. C. Deam 6226, the type of *E. fiscalensis*); Huehuetenango; Quiché. Veracruz; Chiapas; Yucatán (Lundell 7869, type of *E. leptopa*); Honduras; southern Florida; Bahamas; Greater Antilles.

Shrub or treelike, up to 3 meters high, glabrous except for a few reddish hairs on the vegetative buds, the bristly hairs of the staminal ring, and the cilia of the bracts and flower-parts; leaves rigidly coriaceous, ovate, 1.5–3.5 cm. wide, 3–6 cm. long, 1.5–2 times as long as wide, narrowed from the middle or below to a narrow but rounded acute or acuminate tip, rounded or sometimes acute at base, the heavy cartilaginous margins decurrent on the inner angles of the sulcate petiole (1.5–) 3–7 mm. long, up to 1.2 mm. in diameter; midvein impressed above, or sometimes nearly flat; lateral veins (4–) 6–10 pairs in addition to some intermediate ones, obscure above, evident beneath; marginal vein equaling or somewhat more conspicuous than the laterals and irregularly arched between them, 1–3 mm. from the margin; leaves dull green above, paler and often drying pale brown beneath; glands scarcely visible above, evident beneath; inflorescence axillary, actually racemose but the axis ordinarily not elongating (up to 1–2 mm. long) and the 2–4 (–6) flowers seemingly arising directly from the axil [or 1–2 pairs of flowers at the lowermost (bracteate) nodes of a new leafy shoot]; pedicels slender, 6–15 mm. long, up to 0.5 mm. thick; bracts scarious, deciduous, up to 1.5 mm. long, the indurated bases persistent; bracteoles broadly or narrowly ovate, scarious, 0.5–0.8 mm. long, ciliate, persistent or subpersistent; hypanthium hemispheric, or in anthesis substipitate, in post-anthesis soon oblate and separated by a narrow neck from the conspicuous green erect concave calyx-lobes; lobes in

unequal pairs, rounded, broader than long, up to 3.5 mm. wide, ciliate; disk 2.5–3.5 mm. wide, the staminal ring hairy, the margins nearly flat but the calyx-lobes at first somewhat reflexed; style 4.5–5.5 mm. long; stamens about 80, up to 4–5 mm. long, the anthers 0.7 mm. long; petals ciliate, obovate, 4 mm. long; ovary bilocular, the ovules 15–17 in each locule, radiating in a subcapitate group from the central dissepiment; fruit black, globose or oblate, somewhat glandular-roughened, 5–6 mm. long, 7–8 mm. broad.

The plant described as *E. fiscalensis* Donn. Sm. is an abundant shrub, according to notes by Standley, on the very dry rocky hill-sides about Fiscal, the type locality; it is known from the Sierra de las Minas opposite El Rancho, Baja Verapaz (*Kellerman 7894*), and it has also been collected in sterile condition in the Departments of Baja Verapaz and Quiché, and in Honduras. It is poorly known, but on the basis of the available material almost impossible to separate from *E. rhombea*. In *E. fiscalensis* the leaves are usually smaller (2–4 cm. long) and often obtuse rather than acuminate, somewhat more generally rounded at base than the leaves of typical *rhombea*, and a little thinner and more veiny; almost exactly similar leaves may be found, however, on some West Indian specimens of *rhombea*. In the only known flowering specimen of *fiscalensis* the flowers appear to be smaller than usual in *rhombea*, but perhaps not significantly so, and the calyx-lobes and margins of the disk are reflexed in anthesis. More field-study is needed to determine the correct status of *E. fiscalensis*.

***Eugenia riograndis* Lundell, Field & Lab. 13: 10. 1945.**

In forest on ridges, British Honduras, the type from Toledo District, Río Grande, *P. H. Gentle 4784*. Mexico (Tabasco).

Tree up to 25 cm. in diameter, the branchlets and petioles and the inflorescence persistently hispidulous-puberulent; upper leaf-surface uniformly and persistently puberulent with minute curved hairs 0.1 mm. long; leaves elliptic, sometimes broader a little above or below the middle, usually about equally narrowed to the obtusely but narrowly acuminate tip and to the cuneate base, 1–2.5 cm. wide, 4–8 cm. long, 2.5–3.5 times as long as wide, the margins gradually decurrent on the very short, ventrally concave or shallowly channeled petiole 2–2.5 mm. long; midvein flat above, or toward the base shallowly channeled between parallel elevated ridges; lateral veins 5–7 on each side, obscure above, more evident beneath, the marginal vein about as strong as the lateral ones and arched between them, 0.5–1 mm. from the margin; blades nearly concolorous, a little paler and sparingly dark-dotted beneath; inflorescence an axillary raceme (or 2–3 racemes superposed), the axis usually well developed, slender, terete or compressed, 0.5–0.7 mm. in diameter, up to 8–12 mm. long, bearing 3–4 pairs of flowers on slender pedicels 4–5.5 mm. long; bracts divaricate, subpersistent, 0.5–1 mm. long; bracteoles divaricate, thin, persistent but not connate, broadly ovate, 0.5–0.7 mm. long; flowers very small, the buds 1 mm. long; hypanthium broadly campanulate, 0.5–

0.7 mm. long in anthesis, minutely puberulent with erect hairs smaller than those of the pedicels; calyx-lobes rounded-ovate or oblong-ovate, obtuse, membranous, finely ciliate but otherwise essentially glabrous, strongly recurved at base but the concave tips becoming erect, the larger lobes 1.3–1.5 mm. long and wide; disk 0.8–1 mm. wide (up to about 1.5 mm. wide in fruit); style 4–4.5 mm. long; stamens 40–60; petals white, 2 mm. long; ovary bilocular, the ovules about 10 in a compact group in each locule; fruit globose, up to 5–6 mm. in diameter.

This species superficially resembles *Eugenia Capuli* and *E. tikalana*, both of which grow in the same general area, but *E. riograndis* is easily recognized by the unique small hairs of the upper leaf-surfaces, and by the delicate, small-flowered racemes.

Eugenia rufidula* Lundell, Wrightia 2: 209. Sep. 1961. *Cacho de venado; small-leaf turtle bone.

Known only from the type, from high ridge, on bank of creek, Edwards Road beyond Columbia, Toledo District, British Honduras, P. H. Gentle 6385.

A tree 7.5 cm. in diameter, the branchlets, petioles and main veins of the lower leaf-surface hirsutulous with pale reddish hairs; inflorescence (when the fruit is immature) with shorter and coarser pubescence, the pedicels merely minutely hispidulous or puberulent; leaves elliptic, about equally narrowed to the bluntly acuminate tip and the acute base, 0.7–1.4 cm. wide, 2.5–5 cm. long, about 3 times as long as wide, the margins somewhat decurrent on the terete petiole 2–3 mm. long; midvein flat or convex above, somewhat persistently hispidulous; lateral veins 5–6 on each side, obscure above, more evident beneath; marginal vein about equaling the lateral ones and arched between them, 0.5–1 mm. from the margin; blades discolored in drying, the upper surface opaque, blackening, the lower green, dotted with convex glands; inflorescence an axillary raceme (or 2 racemes superposed), the axis 2–6 mm. long, bearing up to 5 pairs of flowers on pedicels 1.5–2 mm. long; bracts divaricate, 0.5–1 mm. long, subpersistent; bracteoles membranous, broadly rounded, persistent but not connate, about 0.5 mm. long and wide, finally explanate somewhat below the immature fruit; buds and flowers not seen; calyx-lobes membranous, prominently gland-dotted, erect and concave on the immature fruit, finely ciliate, sparingly puberulent without, glabrous within, the outer ones 1 mm. wide, 0.7 mm. long, the inner about 1 mm. long and wide; disk 1–1.2 mm. wide; immature fruit globose, 2–3.5 mm. in diameter.

***Eugenia salamensis* Donn. Sm. Bot. Gaz. 27: 333. 1899, var. *salamensis*. *E. tomentulosa* Standl. Contr. U. S. Nat. Herb. 23: 1043. 1924. *E. Mexiae* Standl. Field Mus. Bot. 4: 243. 1929.**

Deciduous woodlands, often in ravines, mountainsides, often at low elevations, 1500 meters or less; Salamá (Llano Grande, Seler 2445, the type); Guatemala; Quiché; Jalapa. Mexico (states bordering the Pacific Ocean, Michoacán to Sinaloa).

Tree 3–5 meters high, loosely appressed-tomentose, the lower leaf-surfaces thinly pubescent to (usually) tomentose with yellowish- or grayish-white somewhat contorted dibrachiate hairs up to 0.5 mm. long; tomentum of the inflorescence and young growth yellowish-white to pale reddish-brown; leaves glabrate above, usually permanently pubescent beneath; blades elliptic-oblong, varying to rhombic-lanceolate or obovate, 3–7 cm. wide, 6–12 (–16) cm. long, 2–3 times as long as wide, rounded to obtuse or bluntly short-acuminate at tip, narrowed or rounded toward the base, and there often subauriculate, the thick revolute margins abruptly and often unequally rounded or contracted to the inner angles of the sulcate petiole 4–10 mm. long, 1.5–2 mm. thick; midvein usually depressed above near base, usually tomentulose, convex or flat, often with narrow elevated median ridge; lateral veins 8–12 pairs, ascending, stronger than the intermediate ones, somewhat elevated above and evident in dried leaves, more conspicuous beneath, diminishing distally, and forming a series of strong arches 1–5 (–10) mm. from the margin and separated from it by a strong net of minor veins; glands inconspicuous on both surfaces; inflorescence an axillary raceme 2–5 cm. long (sometimes with additional subordinate racemes or flowers below the primary ones in the axils), with 1–3 (rarely –5) opposite or subopposite and decussate pairs of flowers; terminal flower sometimes present; pedicels at anthesis up to 6–8 mm. long, 0.5–0.8 mm. thick; fruiting pedicels 1–1.5 mm. thick; bracts and bracteoles linear, 2.5–5 mm. long, densely pubescent, falling at or before anthesis; buds pyriform, 5–6 mm. long, the conic hypanthium expanded into the large calyx that conceals the opening corolla; calyx-lobes in 2 unequal pairs, broadly rounded, tomentulose on both sides, 2.5–4 mm. long and wide, in anthesis persistently concave but spreading from the base, persistent in fruit; hypanthium soon elongating and becoming ellipsoid-oblong; disk (3–) 4–5 mm. wide, the staminal ring bristly, the concave center with some long yellowish hairs; style 7–9 mm. long, sparingly pilose on the lower half; stamens about 150–200, up to 10 mm. long, the anthers 0.6–0.8 mm. long; petals white, about 5 mm. long and wide, ciliate; ovary bilocular, the ovules about 15–20 in each locule, in a sub-capitate group arising from the central dissepiment; fruit first red, finally blue-black with thin flesh, elongate, 10–12 mm. thick, sometimes short-elliptic, little longer than wide, usually 15–20 mm. long, oblong; seed 1, the testa thick-cartilaginous; embryo undivided.

This species is represented in Central America by two varieties in addition to the var. *salamensis* (cf. *Fieldiana, Bot.* 29: 455–457. 1963). Only the var. *Rensoniana* (Standl.) McVaugh (*Psidium Rensonianum* Standl.) is likely to be found in Guatemala. It is known from El Salvador and from the Isthmus of Tehuantepec, Oaxaca, Mexico. It may be recognized by the nearly complete lack of pubescence on the leaves even as early as flowering time, and by the thin, appressed (not loosely tomentose) covering of hairs in the raceme at flowering time. The variety is of somewhat doubtful status.

Eugenia sasoana Standl. & Steyerm. *Field Mus. Bot.* 23: 131. 1944.

Known only from the type, Dept. Chiquimula, rocky slopes along Río Lucía Saso, 3 miles southeast of Quezaltepeque, 1200–1500 meters, Steyermark 31327.

A shrub 5 meters high, nearly glabrous at maturity, the young branchlets and inflorescence probably abundantly appressed-pubescent with sessile dibrachiate hairs, a few pale or coppery hairs 0.2–0.3 mm. long persisting on the leaves, the nodes of the inflorescence and the base of the calyx; leaves "thin," elliptic-lanceolate, 0.7–1.6 cm. wide, 3.5–6.5 cm. long, 3.5–4.5 times as long as wide, about equally contracted to a narrow blunt or bluntly acuminate tip and an acute base; margins abruptly decurrent on the strong inner angles of the deeply channeled and wrinkled pale petiole 3–5 mm. long; midvein a pale flat or concave line in the plane upper surface; lateral veins 10–12 on each side, inconspicuous above, more evident but not prominent beneath, straight; marginal vein about equaling the lateral ones and slightly arched between them, less than 1 mm. from the margin; blades "bright green above," "pale silvery green" and somewhat gland-dotted beneath; inflorescence an axillary raceme about 1.5 cm. long in fruit, the axis 4-angled, 1 mm. thick at base, bearing 2–3 pairs of flowers, the fruiting pedicels up to 6 mm. long, 1 mm. thick; immature fruit oblong-ellipsoid, obtuse at both ends, up to 7 mm. thick, 12 mm. long, "yellow-green with rose," topped by the firm erect incurved calyx-lobes, these 2.5 mm. wide, 3 mm. long, ovate, blunt-tipped, appressed-pubescent within; disk 2–2.5 mm. wide.

Eugenia savannarum Standl. & Steyermark. Field Mus. Bot. 23: 132. 1944.

Savanna between the base of Cerro Chinajá at Sachaj, and Sacacao, Alta Verapaz, 150–180 meters elevation, J. A. Steyermark 45710. Known only from the type collection.

Tree 8 meters high, the branchlets and inflorescence tomentose with loose coppery-red simple or irregularly dibrachiate hairs up to 0.5–1 mm. long; leaves rigidly coriaceous, 4–7 cm. wide, 7–12 cm. long, 2–2.5 times as long as wide, the tip short-acuminate, the base rounded or the margins nearly straight and meeting at about right angles, finally cuneately decurrent on the inner angles of the deeply channeled petiole 10–14 mm. long; midvein deeply and narrowly impressed above; lateral veins rather close and parallel, inconspicuous above, more evident beneath, 10–15 on each side in addition to some intermediate ones, nearly straight; marginal vein about as strong as the lateral ones, nearly straight and little arched between them, 1–1.5 mm. from the margin; leaves hard and lustrous and deep green above, pale beneath with scattered resinous dots; inflorescence a very short stout raceme almost obscured by the dense tomentum, the axis up to 4 mm. long and 1.5 mm. thick including the hair, bearing 1–3 opposite decussate pairs of flowers on tomentose pedicels 3–5 mm. long; bracts broadly ovate, indurate, about 2 mm. long and wide; bracteoles deciduous at anthesis, thin and scarious, oblong or ovate, tomentose without, 1–1.3 mm. wide, 2–2.5 mm. long; buds not seen, probably 6–7 mm. long, the broadly campanulate densely tomentose hypanthium 3 mm. long; calyx-lobes concave, broadly rounded, tomentose on both surfaces, reflexed in anthesis but the tips erect, the larger pair 4–4.5 mm. wide and about as long; disk 3.5–4 mm. wide, the staminal ring bristly, and a zone around the base of the

style tomentose; style ca. 8 mm. long, glabrous; stamens very numerous (about 200), about as long as the style, the anthers 0.7 mm. long; ovary bilocular, the ovules 15–20 in a compact group in each locule; fruit not seen.

Eugenia Shookii Lundell, Wrightia 2: 209. 29 Sep. 1961. *Guayabillo*.

High forest and bordering pine forest, Petén (the type from Dolores, E. Contreras 2629). Endemic.

A tree 8–12 meters high, 15–20 cm. in diameter, the branchlets, inflorescence and young foliage appressed-pubescent with short-stalked dibrachiate coppery-brown hairs up to 0.5 mm. long; leaves elliptic, 2–3.5 cm. wide, 4–8 cm. long, 2–2.5 times as long as wide, abruptly or gradually acuminate (the tip often slender but usually obtuse), acute at base, the margins cuneately decurrent on the inner angles of a rather deeply channeled petiole 6–9 mm. long, 1 mm. thick; midvein deeply and narrowly impressed above; lateral veins 10–12 on each side including some intermediate ones, inconspicuous, more evident beneath, ascending; marginal vein about equaling the lateral ones and arched between them, 1.5–2.5 mm. from the margin; leaves lustrous and dark green above, eglandular, the lower surface much paler (at least when dry), finely gland-dotted; inflorescence a short axillary raceme (a second raceme often superposed), the axis up to 6–11 mm. long, bearing up to 5 pairs of flowers on pedicels 1.5–3.5 mm. long, these up to 1 mm. thick in fruit; bracts 0.5–1 mm. long, mostly deciduous; bracteoles lanceolate, scarious, distinct, pubescent, 0.7 mm. long, subpersistent; buds not seen; hypanthium in post-anthesis sparingly appressed-pubescent, obovoid, 1.8–2 mm. long, narrowed to the mouth; calyx-lobes in unequal pairs, appressed-pubescent within at least near the tips, gland-dotted and nearly glabrous without, reflexed at base but the tips remaining concave, the larger ones 2–2.5 mm. long, up to 2.5 mm. wide; disk glabrous, 1.5–2 mm. wide, often quadrate; style not seen; stamens 60–75; petals (according to Lundell) glabrous, 2.2–2.5 mm. long; ovary bilocular, the ovules 12–15 in each locule; fruit "reddish-black" (according to Contreras), oblong or ellipsoid, obtuse at both ends, 1–1.3 cm. long, 5–8 mm. in diameter, usually with one massive elongate seed.

Eugenia tikalana Lundell, Wrightia 2: 210. 1961. *Guayabillo; chilonche*.

In primary forest of *Achras*, *Brosimum* or *Haematoxylum*, or in secondary associations; lowlands. Petén, the type from Tikal, C. L. Lundell 15971. British Honduras; Campeche(?).

A tree up to 12 meters high, the branchlets, petioles and inflorescence minutely hispidulous-puberulent; leaves membranous, glabrous except for a few hairs above on the midvein, 1.5–3.5 cm. wide, (3–) 4–7 cm. long, (2–) 2.3–3 times as long as wide, gradually but prominently acuminate (the very tip obtuse), acute or cuneate at base, the margins decurrent on the inner angles of the ventrally concave petiole 2–4 mm. long; midvein flat or convex above; lateral veins 6–8 pairs, inconspicuous but stronger than the intermediate ones between them; marginal vein about equaling the lateral ones and arched between them, 1.5–3 mm. from the margin; glands

evident beneath in young leaves, often obscure on both surfaces when the leaves mature; inflorescence an abbreviated axillary raceme (2 or 3 racemes usually superposed), the axis up to about 10 (rarely to 25) mm. long, bearing 3–5 (–6) opposite decussate pairs of flowers on pedicels 2.5–5 mm. long, 0.2 mm. thick (in fruit up to 0.5 mm. thick); bracts scarious, ovate, 0.5 mm. long; bracteoles quadrate or suborbicular, 0.3–0.5 mm. long, persistent but not connate, scarious, pale-ciliate, dotted with large glands; buds 2–2.5 mm. long, pyriform, the campanulate puberulent hypanthium 0.7–1 mm. long, the prominently gland-dotted perianth expanded into a globe above it; calyx-lobes 4, in unequal pairs, nearly glabrous without, glabrous within, rounded, thicker and gland-dotted near base, reflexed at anthesis, the larger ones 1.3–1.7 mm. long and wide; disk 1–1.3 mm. wide, the staminal ring sparingly hairy; style 4–5 mm. long; stamens 45–50, about as long as the style; petals white; ovary bilocular, the ovules 6–10 in each locule; fruit globose, soon glabrate, glandular-verrucose, at first turning reddish-yellow, then purple-black, 9–12 mm. in diameter (occasional forms oval, 1 cm. long, 8 mm. thick, or transversely oval, didymous, 2-seeded, 1 cm. the longer diameter).

This species is superficially almost indistinguishable from *E. Capuli*.

***Eugenia toledinensis* Lundell, Phytologia 1: 307. 1939.**

Known only from the type collection, British Honduras, on creek bank in forest, ca. 600 meters, Camp 23 of the British Honduras–Guatemala boundary survey, *W. A. Schipp S-644*.

A tree 10–11 meters high, 30 cm. in diameter, nearly glabrous at maturity, the inflorescence and probably also the young branchlets and herbage pale-brown-tomentose with coarse contorted and partly forked hairs up to 0.5 mm. long; leaves glabrate, elliptic-oblong, 3–4.5 cm. wide, 10–12 cm. long, 3–3.5 times as long as wide, about equally narrowed to a short-acuminate tip and an acute base, the margins inconspicuously if at all decurrent on the stout rimose, nearly terete petiole 5–6 mm. long, 1.5 mm. thick; midvein convex above, often drying into a narrow elevated ridge except near the base of the blade; lateral veins 10–12 on each side, straight, convex above when dry, similar but more evident beneath, connected by a series of angular asymmetrical arches 3–7 mm. from the margin; upper surface of blade green and lustrous, the lower probably paler, drying brown; glands obscure on both sides; flowers apparently glomerate in much abbreviated axillary racemes, the axis almost none; pedicels in fruit 2–2.5 mm. long and about as thick; fruit brown-tomentose, subglobose, a little longer than wide, about 2 cm. long and 1.8 cm. in diameter, the persistent calyx-lobes tomentose on both sides, concave, broadly rounded, the outer ones about 4 mm. long and wide, the inner pair about 6 mm. wide, 4 mm. long; disk in fruit about 5.5 mm. wide, the depressed tomentose center 4 mm. wide.

***Eugenia Trikii* Lundell, Wrightia 2: 211. 29 Sep. 1961.**

In climax forest of *Brosimum (ramonal)*, and in lowland scrub forest with *Metopium (chechemal)*; Petén (the type from Santa Elena, *E. Contreras 2057*). British Honduras (El Cayo, *Chanek 191*).

A treelike shrub, or a tree up to 8 meters high, 8 cm. in diameter, the branchlets, petioles and inflorescences appressed-pubescent and more or less whitened with pale simple hairs up to 0.3 mm. long; leaves elliptic or ovate, soon glabrate but usually with some fine hairs persistent on the lower surface, 2–3.5 (–5.5) cm. wide, 5–8 (–11) cm. long, 1.9–2.2 times as long as wide, gradually or abruptly acuminate (the tip obtuse), rounded to the base, the margins somewhat decurrent on the inner angles of the rather deeply channeled petiole 6–8 mm. long, 1–1.5 mm. thick; midvein sulcate above; lateral veins 8–10 on each side in addition to some intermediate ones, inconspicuous, somewhat elevated on both sides in dried leaves; marginal vein about equaling the laterals and forming a series of angular arches between them, 1.5–5 mm. from the margin; blades nearly concolorous when dry, apparently lustrous above, with minute rather inconspicuous glands beneath; inflorescence a very short axillary raceme, the axis up to 7 mm. long, bearing up to 4 pairs of flowers on pedicels up to 3 mm. long; bracts ovate or the upper ones oblong, sparingly pubescent, 1–2.5 mm. long; bracteoles deltoid-ovate, nearly glabrous, distinct, persistent, 1.3 mm. long; buds ca. 3–3.5 mm. long, pyriform; hypanthium campanulate, canescent, contrasting strongly with the nearly glabrous calyx; calyx-lobes in unequal pairs, broadly rounded or the outer ones deltoid-ovate, the larger ones 2 mm. wide, 1.3 mm. long; disk about 1.5 mm. wide; style not seen fully developed; stamens about 50, the anthers 0.5 mm. long and wide; petals white, rotund, ciliate, 2.5 mm. long and wide; ovary bilocular, the ovules 4 in each locule; fruit fleshy, purple, globose and 8–10 mm. in diameter (or didymous in two-seeded forms).

Eugenia uniflora L. Sp. Pl. 470. 1753. *E. Michelii* Lam. Encyc. 3: 203. 1789. *Stenocalyx Michelii* (Lam.) Berg, Linnaea 27: 310. 1856. *Cereza de Surinám; pitanga. Surinam cherry.*

Cultivated occasionally in Guatemala, especially about Guatemala and Cobán and in the North Coast, for ornament and for its edible fruit. Native probably of South America, now planted in many tropical regions.

A shrub or small tree sometimes 9 meters high but flowering and fruiting when a shrub of 1–2 meters only, essentially glabrous, with a few coarse reddish hairs up to 0.5 mm. long on the youngest branchlets and leaves, the bracts and bracteoles, calyx-lobes and petals ciliate near the tips; leaves ovate, seldom ovate-elliptic, 1.5–3.8 cm. wide, 2.5–7 cm. long, 1.5–2 times as long as wide, bluntly acuminate at tip, rounded at base, the margins passing abruptly into the subalate inner angles of the adaxially concave petiole 3–4 mm. long, 1–1.3 mm. thick; midvein concave or sulcate above; lateral veins 5–6 pairs, rather prominent beneath and stronger than the intermediate veins, scarcely diminishing distally, but each arching over irregularly to join the next, the marginal arches 1–3 (or often 5) mm. from the margins, with a second series of arches forming a distinct submarginal vein beyond them; leaves dark green and glossy above, paler beneath, usually with numerous pale translucent glands apparent on both surfaces; inflorescence a very short axillary raceme bearing 1–3 approximate decussate pairs of flowers, these subtended by scarious or colored thin bracts 1–2 mm. wide, 3–5 mm. long, and the whole seeming to consist of a subumbellate cluster of flowers surrounded by an

involucre of bracts; floral axis sometimes abortive, but often produced into a new leafy shoot developing with or after the flowers, the lowest sterile leaves (as well as the floral leaves below them) often bractlike and the base of the branchlet covered by the imbricated bracts; pedicels (5-) 10–18 mm. long, filiform, 0.3 mm. thick (up to 0.7 mm. in fruit); bracteoles linear or filiform, distinct, 1–2 mm. long, deciduous before anthesis; buds about 5 mm. long, the short conic hypanthium 1 mm. long, expanded abruptly into the globe of the petals; calyx-lobes somewhat foliaceous, oblong-elliptic, nearly flat, little imbricated, 1.8–2 mm. wide, 2.5–4 mm. long, strongly reflexed with the petals and the margins of the disk at anthesis; disk glabrous, 2 mm. wide; style 4.5–5 mm. long; stamens about 60, up to 7 mm. long; petals white, obovate, 7–8 mm. long; ovary bilocular, the ovules about 20 in each locule, in a subcapitate group from the central dissepiment; fruit tomato-red, very juicy, depressed-globose, 8-costate, 2–3 cm. in diameter.

This species was first described in 1723, from a cultivated plant grown in a garden at Pisa, Italy, and supposed to have come originally from Gôa, where also it must have been cultivated. It is now widespread in cultivation in warm regions, but it is interesting to note that its native region is still in doubt, or has been lost sight of. In recent floras of tropical America, its range is usually given merely as "South America," or "tropical America." Berg, in the *Flora Brasiliensis* (1857) stated clearly that it was a native of tropical Brazil, frequent in the province of Rio de Janeiro, and elsewhere grown in gardens for its edible fruit. In view of its early occurrence at the Portuguese colony of Gôa, it may well have been carried at an early date from the Portuguese colonies in America to those in India.

The following notes are by Mr. Standley: Called "Guinda" in El Salvador. The Surinam cherry is a usually densely branched shrub of handsome appearance. It makes one of the best ornamental hedge plants for Central America if kept low and well trimmed, but if allowed to increase in height it becomes a rather straggling tree. The fruit is very juicy and has a most pleasant spicy flavor, being one of the best of all tropical fruits in the opinion of many people. It makes excellent ice cream, sherbet, and beverages. In Guatemala it grows well from sea level to an elevation of 1800 meters or more. It is one of the few fruits of tropical America that have a pleasantly acidulous flavor suggestive of cherries and other common fruits of the North.

Eugenia vacana Lundell, Phytologia 1: 308. 1939.

On ridges and hillsides, wet forests, often in secondary forest, at low elevations; Izabal. British Honduras, the type from Vaca, El Cayo District, *P. H. Gentle* 2535.

A tree 5–8 meters high, up to 15 cm. in diameter, the young branchlets, foliage and pedicels minutely hispidulous with persistent, crowded erect sharp hairs up to 0.2 mm. long, and also loosely pilose with deciduous yellowish-brown or coppery hollow contorted hairs up to 0.5 mm. long or more; leaves glabrate, the branchlets and inflorescence persistently hispidulous, a few long hairs sometimes persistent on the inflorescence; leaves elliptic, (1) 1.5–3 cm. wide, (2) 3–6.5 cm. long, 2–2.5 (–3) times as long as wide, abruptly or gradually short-acuminate, the base acute or cuneate, the margins decurrent on the inner angles of the sulcate petiole 3–5 (–8) mm. long; midvein impressed above; lateral veins 7–10 pairs, ascending and parallel, passing directly into an arched marginal vein of about the same thickness as the laterals, 0.5–1.5 mm. from the margin; leaves dark green above, and nearly featureless, often drying much darker than the dark-dotted lower surface; inflorescence an axillary raceme, the axis up to 3 mm. long, bearing usually about 3 opposite decussate pairs of flowers on pedicels 4–7 mm. long; bracts broadly rounded, 0.5–0.8 mm. long and wide; bracteoles ovate, acute, persistent, 0.5–0.8 mm. long, at anthesis loosely pilose; buds ca. 2.5 mm. long, the hypanthium 1 mm. long, thinly pilose with contorted hairs, otherwise glabrous; calyx-lobes deltoid-ovate, thin, loosely spreading-reflexed in anthesis, up to 1.5 mm. wide at base, 0.8–1.3 mm. long, glabrous within, thinly hairy without, dotted with large glands; disk somewhat hairy, 1.3–1.5 mm. wide; style 4–4.5 mm. long; stamens about 50, up to 3.5 mm. long; petals obovate, white, ciliate, about 2.5 mm. wide, 3.5 mm. long; ovary bilocular, the ovules 4–6 in each locule, radiating from a centrally attached placenta; fruit globose or oblate, black, 0.7–0.8 cm. in diameter, broadly short-stipitate.

Eugenia vesca Lundell, Wrightia 2: 212. 1961. *Guayabillo*.

In high forest bordering an arroyo, known only from the type locality; Petén (south of Dolores, E. Contreras 2080, the type).

A shrub, or treelike, 1–1.5 meters high, the bark of 1-year-old branchlets scaling off in thin pale reddish-brown platelets; plants essentially glabrous, the vegetative buds and the inflorescence and probably the young shoots (not seen) sparingly strigose with short reddish hairs; leaves elliptic or ovate, 2–5.5 cm. wide, 4–13 cm. long, 2–2.8 times as long as wide, narrowed to a blunt apex or obscurely acuminate, rounded to a cuneate base, the margins rather long-decurrent on the dilated summit of the ventrally flat or concave petiole 4–6 mm. long; midvein channeled above, often bordered by parallel convex ridges; lateral veins 7–10 on each side, more conspicuous beneath; marginal vein about equaling the lateral ones and somewhat arched between them, 1–4 mm. from the margin; blades darker green and verrucose above, with numerous convex glands; lower surface yellow green when dry, sparingly dark-dotted; inflorescence a tight axillary or supra-axillary cluster of about 2–3 opposite and decussate pairs of sessile flowers on a stout axis 1 mm. long or less; bracteoles partly hiding the immature buds, broad and membranous, ciliate, suborbicular or broadly deltoid-ovate, 0.8–1 mm. long, 1–1.3 mm. wide, connate, forming a persistent 2-lobed involucre; immature buds 1.5 mm. long; calyx-lobes in unequal pairs, thin, ciliate, suborbicular, broadly imbricate, the outer ones 1.3 mm. wide; fruit red, globose, 5–7 mm. in diameter, surmounted by the thin erect calyx-lobes.

Eugenia Winzerlingii Standl. Trop. Woods 11: 20. 1927.

Savannah thickets, often or usually on limestone, 200 meters or less; Petén; Alta Verapaz. Yucatán; Campeche; British Honduras, the type from Orange Walk District, *H. W. Winzerling* VIII-7.

Shrub or small tree to 6 meters high, glabrous; leaves rigidly coriaceous, rounded-obovate, oblanceolate or oblong-elliptic, 1.5–5.5 cm. wide, 4–10 cm. long, 1.6–2.3 (–3) times as long as wide, obtuse or rounded at apex, acute or sometimes rounded at base, the thickened cartilaginous margins often rather abruptly narrowed at the very base, there decurrent on the inner angles of the very stout petiole; petiole swollen (as seen on the abaxial surface) at the base of the midvein, its free part 2–4 mm. long, up to 2.5 mm. thick, adaxially nearly flat or concave; midvein prominently convex above, often 0.7–1.1 mm. wide near base; lateral veins 6–9 principal pairs, ascending; marginal vein about equaling the laterals, arched between them (strongly so in some broadly obovate leaves), 2–4 mm. from the margin; veins in dried leaves visible on both surfaces, on the lower surface often forming a conspicuous closed pattern well within the leaf-margin; blades lustrous above, paler and dull and often drying brown beneath; glands obscure, often evident but not abundant beneath; flowers in umbelliform clusters, the inflorescence a very short axillary raceme 2–4 mm. long, 1–2 mm. thick, bearing 1–6 closely approximate opposite decussate pairs of flowers on filiform pedicels 10–20 mm. long (up to 0.6 mm. thick in fruit); bracts scarious, concave, ciliate, ca. 0.7 mm. long and wide; bracteoles persistent, ovate, acute, ciliate, 1–1.5 mm. long; buds 4–4.5 mm. long, the conic hypanthium surpassed by the dome of the petals; calyx-lobes gibbous at base in bud, thin, rounded, in unequal pairs, ca. 2.5 mm. wide, 2 mm. long, somewhat crescent and persistent; disk 1.5–2 mm. wide; style 5–6 mm. long; stamens 40–60, up to 4 mm. long, the anthers 0.7 mm. long; petals white, ciliate, broadly obovate, 5 mm. long; ovary bilocular, the ovules 12–13 in each locule, radiating from a centrally affixed placenta; fruit globose, black, 6–10 mm. in diameter.

Eugenia yucatanensis Standl. Field Mus. Bot. 8: 28. 1930.
Guayabillo.

In forest, at low elevations; Petén (Dolores, *E. Contreras* 2592). Yucatán, the type from Izamal, *G. F. Gaumer* in 1888; Quintana Roo; British Honduras.

A tree as much as 12 meters high with a trunk 25 cm. in diameter, sordid-pubescent, the branchlets and inflorescence and the lower surfaces of young leaves rather densely beset with appressed (simple) coarse stiff hairs up to 0.5 mm. long, and also with shorter suberect antrorse bristle-like hairs; leaves broadly elliptic-ovate, often about equally narrowed to the abruptly acuminate tip and to the rounded or acute base, 2–4.5 cm. wide, 4–9 cm. long, 1.7–2.5 times as long as wide, the margins at base cuneately decurrent on the channeled petiole 5–6 mm. long, 1 mm. thick; midvein impressed above, the narrowly V-shaped furrow usually persistently hispidulous; lateral veins close and parallel, about 10 pairs in addition to rather numerous intermediate ones, apparent on both sides of the blade when dry; marginal vein well defined and relatively straight, about equaling the lateral

ones and arched between them, 1–2 mm. from the margin; leaves at maturity somewhat strigose on both surfaces, or glabrate, lustrous above, scarcely paler beneath, with large translucent glands on both surfaces, sometimes impressed-punctate above; inflorescence a short axillary raceme, or the flowers sometimes at the lowermost (bracteate) nodes of a leafy branchlet, the raceme-axis 7–20 mm. long, bearing 2–6 opposite, decussate pairs of flowers; terminal flower abortive; internodes angular, flattened, 0.5–0.7 mm. wide; pedicels 3–10 mm. long; bracts ovate-deltoid to lanceolate, 1–1.8 mm. long, scarious, somewhat persistent; bracteoles acute, broadly deltoid-ovate, 1–1.3 mm. long, persistent, slightly coherent by their basal margins, convex on the backs, prominently gland-dotted, essentially glabrous, or strigose; buds 3 mm. long, pyriform, the densely pubescent hypanthium 1–1.5 mm. long, canescent; calyx-lobes nearly glabrous without, appressed-pubescent within, in unequal pairs, the outer ones 1.3 mm. long, the inner 1.5–2.5 mm. long, 2 mm. wide, the lobes in fruit subfoliaceous, 2–3.5 mm. long; disk bristly, 2.5 mm. wide; style 3.5–4.5 mm. long; stamens about 40, up to 4 mm. long; petals rotund or obovate, 3–3.5 mm. long; ovary bilocular, the ovules 4–6 in each locule, collateral, pendent; fruit fleshy, purple-black, about 8-costate, 6–7 mm. in diameter.

Material of this species is very similar to Jamaican material that has been identified as *Eugenia disticha* (Sw.) DC. or as *E. biflora* (L.) DC. Urban, in his paper on the West Indian Myrtaceae, interpreted *E. biflora* broadly, including in it many plants with broad, bluntly acuminate and only obscurely glandular leaves; these are quite different from the plants included in this Flora under the name of *E. biflora*, but are indistinguishable from *E. yucatanensis*. It is probable that a thorough revision of the group of *E. biflora* would result in the reduction of *E. yucatanensis*.

***Eugenia Yunckeri* Standl.** Field Mus. Bot. 17: 380. 31 Jan. 1938. *E. siltepecana* Lundell, Amer. Midl. Nat. 19: 430. Mar. 1938.

In forest and along rivers, 1300–2000 meters; to be expected in Guatemala. Mexico (Chiapas, Matuda 1594, type of *E. siltepecana*). Honduras (Comayagua, Yuncker et al. 6178, type).

A shrub or small tree up to 2.5 meters high, the branchlets, petioles and inflorescences densely tawny-hirsutulous; lower leaf-surfaces similarly but less densely hirsute, the erect lustrous hairs 0.5–1 mm. long; leaves elliptic, 2–4 (–5.7) cm. wide, (5–) 7–12 (–15) cm. long, 2–3 times as long as wide, obtuse or usually broadly and bluntly acuminate at tip, rounded to the acute or cuneate base, the somewhat revolute margins shortly decurrent on the stout nearly terete petiole 7–12 (–15) mm. long, 1.5–2.5 mm. thick including the hairs; midvein somewhat impressed above, hairy; lateral veins 8–10 on each side, ascending, inconspicuous above, apparent beneath; marginal vein about equaling the lateral ones and arched between them, 2–4 mm. from the margin; blades usually drying brown to black, probably lustrous above when fresh, paler beneath, the glands inconspicuous; inflorescence a crowded axillary raceme, the axis 4 mm. long or less, bearing 3–4 pairs of flowers on pedicels 1–2 mm. long or less; bracteoles oblong, distinct, gla-

brous on the inner surface, 0.7 mm. wide, 1.5–1.7 mm. long; buds pyriform, 3–4 mm. long; hypanthium campanulate, densely hirsute, 1.7–2.5 mm. long; calyx-lobes broadly rounded, hirsute without, finely pubescent within, up to 2.5–3 mm. wide, 2.5–4 mm. long, the smaller ones about 2 mm. long and wide; disk 2.5–3.5 mm. wide, often quadrate, hirsute; style about 7 mm. long; stamens about 125; ovary bilocular, the ovules about 8–10 in a compact group in each locule; fruit globose or oval, sparingly short-hirsutulous, 1.2–1.5 cm. in diameter, 1.3–1.5 cm. long, crowned by the subpersistent calyx-lobes.

SPECIES INSUFFICIENTLY KNOWN

Eugenia ardisioides Lundell, Amer. Midl. Nat. 29: 479. 1943.

British Honduras, Toledo District, Monkey River, Jenkins Creek, in hammock in pine ridge, *P. H. Gentle* 4081, the type. Unknown except from this collection.

A small tree with thin broadly elliptic and somewhat acuminate leaves 6–13 cm. long, the racemes minutely puberulent, slender and short, the pedicels 2.5–5 mm. long, the flowers small. The type bears somewhat immature fruit 5–6 mm. in diameter. The leaves suggest in appearance those of *E. acapulcensis*, but the midvein is scarcely impressed; the racemes are more open than those of *E. acapulcensis*.

Eugenia itzana Lundell, Bull. Torrey Club 69: 395. 1942.

Doubtfully an independent species, *E. itzana* seems to fall between *E. acapulcensis* and *E. axillaris*. All four specimens cited in the protologue of *E. itzana* are small-flowered for *acapulcensis*, resembling in this respect *E. axillaris*. One paratype, *Steere* 1373, is scarcely distinguishable from *axillaris*. The type (Yucatán, Chichen Itzá, *Lundell* 7589) is an immature flowering specimen, suggesting superficially a small-leaved representative of *acapulcensis*. Similar specimens may yet be found in Petén.

Eugenia oblanceifolia Lundell, Amer. Midl. Nat. 29: 480. 1943.

British Honduras, Toledo District, Monkey River, Jenkins Creek, in hammock in pine ridge, *P. H. Gentle* 4078, the type. Unknown except from this collection.

A small tree with thin narrowly elliptic and gradually acuminate leaves 4–8.5 cm. long, the racemes minutely puberulent, 1 cm. long or less, the pedicels 2.5–6 mm. long, the flowers small. The type bears mature or nearly mature fruit about 6 mm. in diameter.

This species, as originally suggested by Dr. Lundell, is very similar to *E. ardisioides*, from which it hardly differs except in its somewhat narrower leaves. Like *E. ardisioides* it somewhat resembles

E. acapulcensis, but the racemes are more like those of, e.g., *Eugenia riograndis*.

***Eugenia perobtata* Lundell, Wrightia 2: 124. 1961.**

British Honduras, El Cayo District, high ridge, hill slope, Gorge Creek section, Humming Bird Highway, P. H. Gentle 8845, the type. Known only from this collection.

A tree "2 inches in diameter," the young branches and the petioles and probably the inflorescence hispidulous; leaves elliptic, 2.5–3 cm. wide, 8–11 cm. long, about 3 times as long as wide, about equally narrowed to the narrowly acuminate tip and the gradually rounded base, the margins passing abruptly into the nearly terete petiole 1 mm. thick, 5–6 mm. long; midvein convex or nearly flat above, pubescent most of its length; lateral veins slender and nearly parallel, 10–12 pairs including some intermediates; marginal vein about equaling the lateral ones, rather well-defined and straight, 1.5–3 mm. from the margin; leaves nearly concolorous when dry, the glands obscure on both surfaces; vegetative buds prominently imbricate-scaly with keeled scales; inflorescence and flowers not seen; fruits seen detached, the flowers and fruits probably borne in sessile or nearly sessile clusters at defoliated nodes; ovary and prolonged rim of the hypanthium apparently coarsely hairy, the fruit glabrate, strongly oblate, 1.5 cm. high, 2–2.5 cm. in diameter, surmounted by the irregularly rupturing remains of the hypanthium and calyx; seed 1, the cotyledons free, fleshy, plano-convex, one in the upper half and the other in the lower half of the fruit; radicle (ex Lundell) short but conspicuous.

This plant bears a considerable superficial resemblance to the little-known South American and West Indian species that has been variously known as *Myrciaria involucrata* Berg, *Marlierea glomerata* Berg, and *Plinia pinnata* L. (sensu Urban, Repert. Sp. Nov. 15: 412–413. 1919, et al.). It almost certainly is not that species, but the two species are sufficiently alike in vegetative characters to suggest they are congeneric. Certainly the characters of the fruit of *E. perobtata* exclude it from *Eugenia* and suggest that it belongs with *Plinia* as that genus was interpreted by Amshoff (Fl. Suriname 3: 97–99. 1951) and McVaugh (Fl. Peru 775–780. 1958). I prefer not to transfer it formally to *Plinia* in the absence of knowledge about its flowers and the details of its ovarian structure.

***Eugenia uliginosa* Lundell, Wrightia 3: 20. 1961.**

Known only from the type, an over-mature fruiting specimen; Chiapas, La Grandeza, alt. 2016 meters, E. Matuda 5546.

A tree 3–4 meters high, glabrous; leaves coriaceous, elliptic-ovate, about 4 cm. wide, 9 cm. long, rounded to a short blunt acumen and to a cuneate base, the revolute margins strongly decurrent on the dilated summit of the channeled peti-

ole about 1 cm. long; midvein flat or concave above; lateral veins 10–15 on each side including some intermediate ones; marginal vein about equaling the lateral ones and but slightly arched between them, 1–2 mm. from the margin; blades probably glossy above, paler and finely gland-dotted beneath, the upper surface obscurely glandular-verruculose; inflorescence a very short axillary raceme or 2 racemes superposed, the axis up to 3 mm. long, quadrangular and 2 mm. thick in fruit, bearing up to 3 pairs of flowers; pedicels in fruit 5 mm. long, 1.5 mm. thick; bracteoles indurate-persistent, very short; fruit 1.5–1.8 cm. in diameter, with nearly globose body and stout stipe, the whole 2.3 cm. long; calyx-lobes apparently broadly rounded, 3 mm. wide; disk 3 mm. wide in fruit; seed one, homogeneous.

Superficially this specimen suggests *E. Percivalii* Lundell, but that species is pubescent in the flowering condition, and is a plant of the lowlands of British Honduras.

MYRCIA DC.

References: Berg, Linnaea 27: 35–80, 82–129. 1855–1856; and in Mart. Fl. Bras. 14, pt. 1: 59–143, 150–210. 1857.

Calyx-lobes usually 5, distinct and imbricated in bud and in flower, and usually persistent on the fruit; hypanthium variously or not at all prolonged beyond the summit of the ovary; petals usually 5, often half as long as the stamens or longer, and conspicuous. Inflorescence a many-flowered panicle [i.e. several times compound; the central axis, and those of the principal branches of the panicle, prolonged and bearing several pairs of lateral branches]. Ovules 2. Embryo with long radicle, and thin, foliaceous, much-folded cotyledons. Fruit thin-fleshed, 1- or 2-seeded.

The term "panicle," as used below in the descriptions of species of *Myrcia*, refers to the entire fertile branch that arises in the axil of a leaf; in *M. leptoclada* the two panicles at a node may arise from the two foliar axils; more commonly they arise from the opposite sides of a nearly naked node [i.e. merely subtended by small bractlets], and this pair of panicles may appear to be terminal because the branchlet bearing them fails to develop beyond the bracteate node at which they arise.

A large genus of tropical America, including probably several hundred species. A few species not treated below occur in Costa Rica and Panama.

Summit of the ovary and interior of the hypanthium glabrous; flower-buds glabrous or nearly so; plants blackening in drying, nearly glabrous, the young branchlets and the inflorescence with somewhat appressed coppery partly dibrachiate hairs; fruit depressed-globose. *M. leptoclada*.

Summit of the ovary and interior of the hypanthium densely hairy; flower-buds densely pale strigose or -silky toward the base; plants green in drying, the

branchlets and the inflorescence abundantly pubescent with yellowish or pale reddish ascending simple hairs; fruit oblong or oval to nearly globose.

M. splendens.

Myrcia leptoclada DC. Prodr. 3: 244. 1828. *Aulomyrcia leptoclada* (DC.) Berg, Linnaea 27: 40. 1855. *Myrcia Gentlei* Lundell, Wrightia 2: 214. 1961.

Wet forests near sea level; Izabal (Puerto Barrios, Standley 73072). British Honduras (Toledo Dist., P. H. Gentle 4378, type of *M. Gentlei*); Honduras; Greater Antilles to Trinidad; Suriname.

A shrub or a tree up to 15 meters high, blackening in drying, the branchlets and inflorescence sparingly pubescent with partly appressed coppery partly di-brachiate hairs 0.2–0.4 mm. long; leaves coriaceous, ovate to elliptic or elliptic-lanceolate, 2–5 cm. wide, 6–12 cm. long, 2–3 times as long as wide, gradually and bluntly acuminate at tip, rounded to the base, rather abruptly contracted to the very base but the margins shortly decurrent on the inner angles of the channeled petiole 2.5–4 mm. long; midvein impressed above; lateral veins close and parallel, 12–15 on each side in addition to some intermediate ones, nearly straight, passing directly into the marginal vein which is arched between them, 2–3 mm. from the margin; blades nearly concolorous when dry, coffee-brown to black, lustrous, the glands inconspicuous; paired panicles arising from the lowermost (bracteate) nodes of leafy branchlets or (usually) paired at the summit of an abortive axillary axis 2–4 mm. long, the individual panicles 5–9 cm. long, many-flowered, 3 times compound, very broadly pyramidal, the peduncle 1–3 cm. long, the lowest lateral branchlets much longer, irregularly and often alternately branched, their elongate tips often raceme-like with 2–3 pairs of flowers each, on pedicel-like branchlets 1–2 mm. long; buds turbinate, rounded at apex, 2 mm. long including a short-stipitate base, the hypanthium glabrous; calyx-lobes 5, strigose without, appressed-pubescent within near the tips, very unequal, the three outer ovate-deltoid, thickened at base, 0.5–1 mm. long, the two inner ones orbicular, membranous, almost petaloid, 1.5 mm. long and 1.5–1.8 mm. wide; disk bowl-shaped, 1.5 mm. wide, glabrous; style 3–4 mm. long; stamens about 75; petals white, 1.5 mm. long; fruit black, glabrous, depressed-globose or transversely oval, 1- to 2-seeded, 7 mm. high, 7–10 mm. broad.

Called "parrot plum" in British Honduras.

Myrcia splendens (Sw.) DC. Prodr. 3: 244. 1828. *Myrtus splendens* Sw. Prodr. 79. 1788 (type from Hispaniola). *Myrcia rufidula* Schlecht. Linnaea 13: 416. 1839 (type from Veracruz, Schiede & Deppe). *M. costa-icensis* Berg, Linnaea 27: 104. 1855 (type from Costa Rica, Oersted). *M. discolor* Berg, l.c. 111 (type from Costa Rica, Oersted). *M. Oerstediana* Berg, l.c. 112 (type from Turrialba, Costa Rica, Oersted 28). *M. melanoclada* Berg, l.c. 113 (type from Cartago, Costa Rica, Oersted 7). *M. plicato-costata* Berg, l.c. 114 (type from Turrialba, Costa Rica, Oersted). *M. Sartoriana* Berg,

Linnaea 29: 220. 1858 (type from Veracruz, *C. Sartorius*). *M. longicaudata* Lundell, Amer. Midl. Nat. 29: 481. 1943 (type from Lantilla Valley, Honduras, A. M. Chickering 158). *M. Schippii* Lundell, l.c. 482 (type from All Pines, Stann Creek District, British Honduras, W. A. Schipp 797). *Agal* (Huehuetenango).

Moist or wet thickets, or dense or open, mixed or pine forest, sometimes on limestone, 1650 meters or less; Petén; Alta Verapaz; Huehuetenango; San Marcos. Southern Mexico (Veracruz); British Honduras; Honduras; West Indies; South America.

A shrub or small tree 2–5 or sometimes 10 meters high, up to 15 cm. in diameter, abundantly pubescent with ascending lustrous yellowish- or brownish-white or sometimes rufous hairs up to 1 mm. long (often 0.5 mm. long); hypanthium, branchlets and inflorescence, and the dorsal surface of the midvein closely silky-strigose or somewhat shaggy; calyx-lobes and lower leaf-surface sparingly or closely strigose; leaves elliptic-lanceolate, elliptic, or ovate-lanceolate, 2–4 (–4.5) cm. wide, 6–12 cm. long (up to 16.5 cm. long on shoots), (2.2–) 2.5–3 (–4) times as long as wide; blades abruptly narrowed at tip to a blunt point or, usually, rather narrowly acuminate, often with slender tip 0.8–2 cm. long; base cuneate or, usually, rounded with the margins cuneately decurrent on the stout channeled petiole 3–4 mm. long; midvein impressed on the upper surface, usually bearing a line of stiff, often erect hairs for most of its length; lateral veins rather close together and parallel, 12–20 pairs in addition to some intermediates, elevated on both surfaces in dried leaves but not very conspicuous, the small connecting veins forming a conspicuous network; marginal vein about equaling the laterals and but slightly arched between them, 1 (–2) mm. from the margin; upper surface of the blade smooth and lustrous, bright green, the lower paler; convex glandular dots sometimes apparent on new leaves, rarely on mature leaves, the glands never impressed-punctate; inflorescence axillary and subterminal, 4–6 (–7.5) cm. long, with up to about 50 flowers (often fewer) in each panicle, 3 times compound, the branches opposite or nearly so, terete or but slightly flattened below the nodes (1–1.5 mm. wide below the first node); peduncle usually 1.5–2.5 cm. long, often $\frac{1}{3}$ – $\frac{1}{4}$ as long as the entire panicle; flowers aggregated toward the tips of the branches; buds 2–2.5 mm. long before anthesis, the hypanthium narrowly turbinate; calyx-lobes 5, drying dark, glabrous or very sparingly hairy on the inner surface, bluntly deltoid or broadly rounded, 1–1.2 mm. long, about 1.5 mm. wide, often reflexed in post-anthesis; disk about 2 mm. wide, densely hairy, the center slightly or markedly depressed; style 3.5–5 mm. long, hairy near base or below the middle; petals white, about 2–3 mm. long; stamens white, about 75–85, nearly as long as the style; fruit oblong or oval, or sometimes nearly globose, at first red, turning black, at maturity about 1 cm. long.

This species belongs to a complex that is taxonomically poorly known (cf. *Fieldiana, Bot.* 29: 470–473. 1963). It is closely related to several South American species, viz. *M. acuminata* (HBK.) DC., *M. fallax* (Rich.) DC., and *M. mollis* (HBK.) DC. In *M. splendens* and *M. fallax* the inner face of the calyx-lobes is entirely glabrous or very sparingly pubescent. In *M. mollis*, a Colombian species

extending northward as far as Costa Rica, the calyx-lobes are about equally soft-hairy on both sides; the inflorescence is stouter than that of *M. splendens*, the peduncle usually 2–2.5 mm. wide below the first node. Calyx-lobes that are pubescent on the inner surface may be found in an occasional Central American specimen (e.g. Schipp 797, the type of *M. Schippii*), but these specimens do not seem to differ otherwise from the less pubescent ones, more typical of *M. splendens*, found in the same localities.

A species of somewhat doubtful status is *Myrcia belizensis* Lundell, Wrightia 2: 213. 1961, described by the collector as a woody vine. This is known only from one locality in British Honduras (near San Antonio, Toledo District, Gentle 6571, the type). The specimens resemble *M. splendens* but the petioles are 5–9 mm. long, resembling in this respect those of *M. fallax*. The latter, not yet reported from Central America except from Panama, has a relatively stout inflorescence, the peduncle usually 2–2.5 mm. wide just below the first node.

MYRCIANTHES Berg

Reference: McVaugh, R., Fieldiana, Bot. 29: 473–497. 1963.

Calyx-lobes 4, rarely 5, distinct, imbricated, persistent. Hypanthium not prolonged beyond the summit of the ovary. Petals as many as the calyx-lobes, conspicuous. Ovary usually bilocular, the ovules several (5–20, usually 10–15) in each locule, in a subcapitate group attached near the middle of the central dissepiment. Seeds one or two, the cotyledons distinct, accumbent, large, plano-convex; radicle often hairy, stout, usually about one-third as long as the cotyledons or less; plumule often silky-hairy, much shorter than the radicle. Inflorescence an axillary dichasium, the terminal flowers usually sessile in the forks.

An American genus of about 40 species, from peninsular Florida, the West Indies and Mexico to Argentina and Bolivia. Only the following species is known from northern Central America; one or two additional species occur in Costa Rica and Panama.

Myrcianthes fragrans (Sw.) McVaugh, Fieldiana, Bot. 29: 485. 1963. *Myrtus fragrans* Sw. Prodr. 79. 1788. *Eugenia fragrans* (Sw.) Willd. Sp. Pl. 2: 964. 1800. *Anamomis fragrans* (Sw.) Griseb. Fl. Brit. W. Ind. 240. 1860. *E. triflora* Sessé & Moc. Naturaleza II. 1: app. 83. 1888 (type from Cuernavaca, Morelos). *Myrtus biflora* sensu Sessé & Moc. Fl. Mex. ed. 2. 125. 1894 (type from Córdoba, Veracruz). *Myrcia Seleriana* Donn. Sm. Bot. Gaz. 27: 332. 1899 (type from Chaculá, Guatemala, Seler 3169). *E. Steyermarkii* Standl. Field Mus. Bot. 22: 360. 1940 (type from Guatemala near Volcán

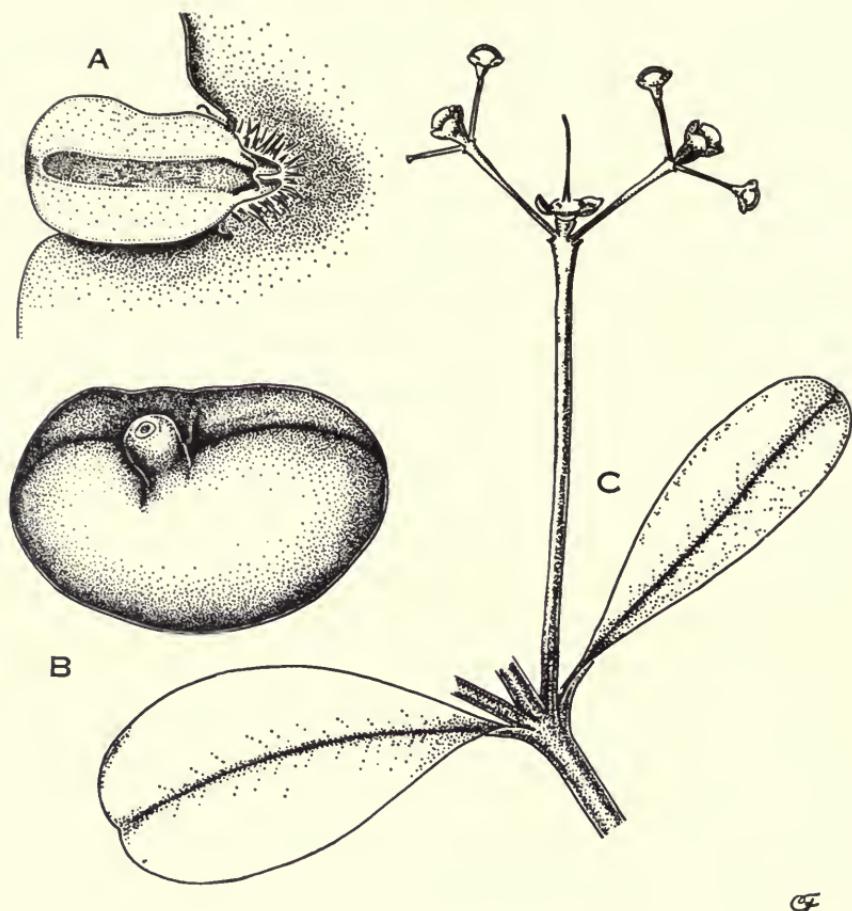


FIG. 52. Dichasium and embryo in *Myrcianthes*. A, The inner face of one cotyledon showing position of hypocotyl and radicle and small plumule at right; \times ca. 17. B, Seed (somewhat generalized) with outer coats removed to show plano-convex cotyledons and projecting radicle; \times ca. 7. C, Seven-flowered dichasium of *M. fragrans* (Steere 2976); \times $\frac{2}{3}$.

de Tacaná, Steyermark 36210). *E. Lopeziana* A. Molina, Ceiba 3: 170. 1953 (type from Honduras, Molina 3007).

Wet or moist, mixed forest, on limestone, or in pine-oak forest, 800–2000 meters; Baja Verapaz; Quezaltenango; Sacatepéquez; San Marcos; Huehuetenango. Southern Florida; eastern and southern Mexico; British Honduras; Honduras; Nicaragua; Costa Rica; West Indies; northern South America.

A shrub or small tree up to about 15 meters high, the brown outer bark peeling off in plates and exposing the paler or cream-colored inner bark; herbage and

branchlets more or less pubescent with pale appressed or ascending hairs, the hypanthium whitened by a dense covering of gray-white hairs, contrasting with the green glabrous calyx-lobes; petals and calyx-lobes ciliate, the latter also appressed-hairy within; leaves glabrate, elliptic to ovate or obovate, 1.5–3.5 cm. wide, 3–7 cm. long, 1.8–2.6 times as long as wide, obtusely pointed or obtusely acuminate or occasionally rounded at apex, acute at base or the margins at right angles, usually cuneate at very base and the margins decurrent on the channeled petiole (2.5–) 4–6 mm. long; midvein impressed above, prominent beneath; lateral veins about 8–12 on each side, indistinct and often with smaller intermediate veins, slightly elevated on both sides when dry; marginal vein about equaling the laterals and arched between them; blades somewhat lustrous above, paler beneath, copiously dotted with minute glands; inflorescence a 3- or often 7-flowered dichasium (sometimes reduced to a single flower on a pedicel 1 cm. long), the central flower usually sessile, the 2 lateral flowers sessile or on branches 3–5 mm. long; peduncle 2–4 (–6) cm. long, (0.7–) 1.2–1.5 mm. wide at apex, somewhat compressed; bracts and bracteoles linear, 2–3 mm. long, falling at anthesis; calyx-lobes usually 4, (rarely 5 in some flowers), broadly rounded, 2.5–3.5 mm. wide at base, all alike or in 2 unequal pairs, the outer pair thicker and somewhat obtusely deltoid; disk usually quadrate, 3–3.5 (–4) mm. wide, the staminal ring hairy, the flat central portion glabrous; style 6.5–7.5 mm. long; stamens about 150, the longer ones 7–9 mm. long; petals white or yellowish white, concave, oblong-obovate, 4–6 mm. long; ovary bilocular; ovules 15–20 in each locule, radiate in a subcapitate group affixed to the central dissepiment; fruit dark purple-black, subglobose, smooth or roughened by the numerous superficial glands, about 1 cm. in diameter; seed bean-shaped, usually only one maturing; cotyledons 2, plano-convex; radicle short less than half as long as the cotyledons; plumule silky, often very short.

This variable species ranges widely around the Caribbean, and perhaps may ultimately be divided into several infraspecific taxa. Most specimens from the continent of North America, and a few from northern South America, are similar to the nomenclaturally typical plant of Jamaica (*M. fragrans* var. *fragrans*) except that the petioles are often longer, the leaf-blades narrower and the dichasia often 7-flowered instead of 3-flowered. The few Guatemalan specimens I have seen are of this type. A specimen from Quintana Roo, however (Cozumel Island, Steere 2976), resembles rather the strongly glandular plant with obovate-oblong leaves that is common in Cuba and Hispaniola. The var. *hispidula* McVaugh, a plant of Costa Rica and Panama, has not been found in northern Central America.

MYRCIARIA Berg

Reference: Berg, Linnaea 27: 320–338. 1856; and in Mart Fl. Bras. 14, pt. 1: 358–376. 1857; McVaugh, R., Fieldiana, Bot. 29: 499–504. 1963.

Calyx-lobes 4, distinct and imbricated. Hypanthium markedly prolonged above the summit of the ovary, circumscissile at base, and cleanly deciduous,

with the perianth and androecium, about the time of anthesis. Flowers subsessile, in racemously arranged clusters of (usually) 4 each. Ovules 2. Embryo (according to Amshoff) undivided. Fruit fleshy, subglobose, about 2-seeded, naked and umbilicate at apex.

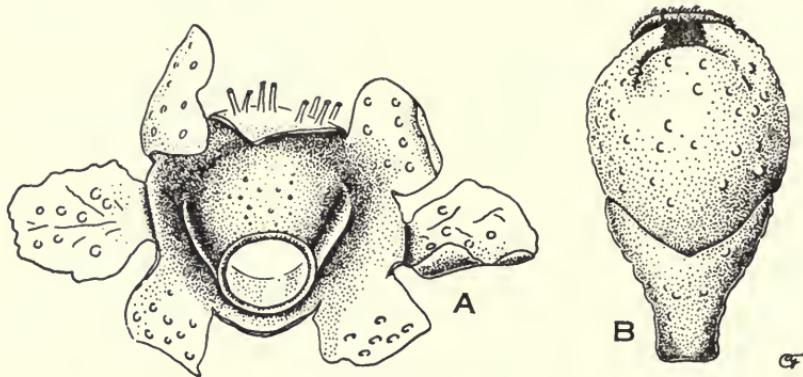


FIG. 53. *Myrciaria floribunda*. A, Open flower somewhat past anthesis, from below, showing the base of the hypanthium after circumscission. B, Lateral (i.e. dorsal) view of bud, showing partly enveloping bracteoles at base. Both $\times 15$.

A well-marked genus, probably of about 25 species, in tropical America from Mexico and the West Indies southward, particularly at low elevations. One additional species occurs in Costa Rica and Panama.

Leaves of an ovate type, mostly 2–2.5 times as long as wide, sharply acuminate and often cuspidate, broadly rounded at base, the margins little if at all decurrent on the petiole; branchlets and petioles coarsely and rather sparsely hispidulous; flowers sessile; bracteoles very broadly rounded and imbricate, connate at very base only, 1.5–2 mm. long and wide, much exceeding the ovary; Guatemala (Petén). *M. Ibarrae*.

Leaves of a lanceolate type, mostly 2.5–3 times as long as wide, variously acuminate but the very tip usually blunt or merely acute, the base of the blade somewhat rounded below the middle, usually acute or cuneate with the margins cuneately decurrent on the splayed summit of the petiole; branchlets and petioles finely pubescent or rarely glabrous; pedicels usually 0.5–1 mm. long; bracteoles not imbricate (or very slightly so in the bud stage), united by their proximal margins into an oval bilobed or finally explanate involucre 2 mm. long; West Indies; eastern Mexico and Central America; Colombia; lowlands of the Guianas; Orinoco and Amazon lowlands from southern Venezuela to Peru and eastern Brazil (Maranhão). *M. floribunda*.

Myrciaria floribunda (Willd.) Berg, Linnaea 27: 330. 1856.
Eugenia floribunda West ex Willd. Sp. Pl. 2: 960. 1800. *E. O' Neillii* Lundell, Bull. Torrey Club 64: 555. 1937 (type from British Honduras, Hugh O'Neill 8767). *M. O' Neillii* (Lundell) I. M. Johnst. Sargentia 8: 228. 1949.

Wet thickets, mangrove swamps or mixed forest, 600 meters or less; Petén; Alta Verapaz; Izabal. Southern Mexico (Oaxaca, Tabasco, Chiapas); British Honduras; El Salvador; Costa Rica to northern Colombia; West Indies; Guianas; eastern Brazil.

Shrub or small tree up to 10 meters high, 15 cm. in diameter; branchlets reddish brown, the bark checking longitudinally and peeling in small plates; branchlets and young growth finely soft-pubescent, the leaves glabrate, the inflorescence somewhat pubescent; leaves ovate or lanceolate, 0.7–2 (–3) cm. wide, 2.5–6 (–8) cm. long, 2.5–3 (–4) times as long as wide, caudate-acuminate (the tip sometimes 2 cm. long, 2.5–3 mm. wide at base), or less often short-acuminate or merely acute, the very tip usually blunt; blade rounded in the proximal third to the mostly acute or cuneate base, the margins somewhat decurrent on the broadened summit of the flat or sometimes sulcate petiole 3–6 mm. long; midvein flat or slightly concave above, often persistently pubescent like the petiole; lateral veins rather numerous, nearly straight and parallel, 10–20 pairs, passing directly into a marginal vein, the latter nearly straight, parallel to the leaf-margin and about 0.5–1 mm. from it; blades rather thin, the two surfaces nearly concolorous, the upper somewhat lustrous, light green and nearly featureless, the lower usually with some convex glands when dry; inflorescence axillary, or apparently somewhat supra-axillary; axis less than 1 mm. long, bearing 1 or 2 decussate pairs of flowers on stout pedicels up to 0.5 mm. thick, 0.5–1 mm. long; bracts dark brown, broadly rounded, ciliate and pubescent, 0.8 mm. wide; bracteoles persistent, broadly rounded, ciliate and pubescent without, united by their proximal margins into a cuplike involucre 0.5–0.6 mm. high, this finally explanate, 2 mm. long, 1.5 mm. wide; hypanthium sessile, broadly conic or cup-shaped, about 1.5 mm. high and 1.5 mm. wide at the mouth, deciduous after anthesis, glabrous within and without; calyx-lobes broadly rounded, densely silky-pubescent within, and near the tips on the outer surface, the free parts broadly rounded, 1–1.5 mm. wide, imbricate in the bud, at anthesis separating by irregular splits in the distal half of the hypanthium; bracteoles, hypanthium, calyx-lobes and corolla with prominent large glands; style 4–5 mm. long, pilose below with long pale hairs like those of the summit of the ovary; stamens about 75, up to 5 mm. long, the anthers 0.5 mm. long; petals irregularly ovate, ciliate, 1.5 mm. long; ovary bilocular, the ovules 2 in each locule, collateral; fruit soft, globose or oblate, about 7 mm. in diameter, naked at apex, the circular scar there about 1 mm. across.

Myrciaria Ibarrae Lundell, Wrightia 2: 213. 1961. *Guayabillo*.

In low forest (*zapatal*), in lowlands; Petén, the type from Dos Lagunas, E. Contreras 1645. Endemic.

A tree 8–10 meters high, 7–10 cm. in diameter, the branchlets and petioles uniformly hispidulous-pubescent with coarse bristle-like erect or often antrorsely crisped pale hairs 0.3–0.5 mm. long; leaves glabrous or the midvein retaining some hairs, the blades ovate or lance-ovate to elliptic, 1–2 (–2.8) cm. wide, 4–6 (–8) cm. long, (1.7–) 2–2.5 (–3) times as long as wide, the apex gradually and sharply acuminate, often cuspidate, the base broadly rounded, the margins not at all or scarcely decurrent, passing abruptly onto the inner angles of the chan-

neled petiole 4–7 mm. long; midvein flat above or concave toward the base, prominent as a pale line beneath; lateral veins obscure, close and parallel, very slender, 15–20 or more on each side including the intermediate ones; marginal vein about equaling the lateral ones, nearly straight, 0.3–0.7 mm. from the revolute cartilaginous margin; leaves nearly concolorous, with scattered small convex glands beneath; flowers sessile, nearly glabrous, in sessile clusters of 2–6 (usually 2) at a node, the racemose axis about 1 mm. long and 1 mm. thick, with up to 4 approximate nodes; bracts indurate, ovate-deltoid to reniform, strigose, persistent; bracteoles broadly rounded, pale, ciliate, concave, coriaceous, up to 1.5 (–2) mm. long and wide, strongly imbricate at least in the young flower and half-enveloping the oval buds which are 2.5–3 mm. long, contracted toward the mouth; hypanthium prolonged 1.5 mm. beyond the summit of the ovary, glabrous without and within, its base 1–1.3 mm. in diameter at time of abscission; disk whitetomentose, 1–1.5 mm. wide; style 5–6 mm. long; calyx-lobes in unequal pairs, short and broadly rounded, appressed-pilose within, the larger ones 1–1.5 mm. wide, less than 1 mm. long; stamens about 75, up to 5 mm. long, the anthers 0.4 mm. long; petals 4, ciliate, ovate to subrotund, white, 1.5–2 mm. long and wide; locules 2, the ovules 2 in each locule; fruit (according to Lundell) globose, 1- or 2-seeded, up to 2.5 cm. in diameter, the embryo homogeneous.

According to Lundell the large fruit is edible and was undoubtedly utilized by the ancient Maya. The species is extremely well marked for a member of this genus, but seems to be an endemic of very limited distribution, never having been reported except through the specimens cited in the protologue.

PIMENTA Lindley. Allspice.

Calyx-lobes 4, distinct, imbricated in bud and in flower, persistent on the fruit; hypanthium not or scarcely produced beyond the summit of the ovary; petals 4. Inflorescence a many-flowered panicle [i.e. several times compound; the central axis, and those of the principal branches of the panicle, prolonged and bearing several pairs of lateral branches]. Ovary bilocular, the ovules 1 (–2) in each locule. Embryo involute-cyclic, forming a double spiral. Fruit fleshy, verrucose, usually 2-seeded. Whole plant very fragrant.

The genus consists of a single species.

Pimenta dioica (L.) Merrill, Contr. Gray Herb. 165: 37, f. 1. 1947. *Myrtus Pimenta* L. Sp. Pl. 472. 1753. *M. dioica* L. Syst. Nat. ed. 10. 1056. 1759. *Pimenta officinalis* Lindl. Collect. Bot. sub t. 19. 1821. *Myrtus Tabasco* Schlecht. & Cham. Linnaea 5: 559. 1830 [as to Mexican specimens only, not as to type]. *Eugenia micrantha* Bertol. Nov. Comm. Acad. Bonon. 4: 422. 1840 (type from somewhere in Guatemala, *J. Velásquez*). *Pimenta officinalis* [Berg], ε *Tabasco* sensu Berg, Linnaea 27: 425. 1856 [not *Myrtus Tabasco* Schlecht. & Cham.]. *P. Pimenta* (L.) Karst. Deut. Fl. Pharm. Med.

Bot. 790. 1882. *Myrtus piperita* Sessé & Moc. Fl. Mex. ed. 2. 124. 1894 (the type from Papantla, Veracruz, Sessé et al. 2043). *Pimenta dioica* var. *Tabasco* sensu Standl. Ceiba 3: 172. 1953 [not *Myrtus Tabasco* Schlecht. & Cham.]. *P. Tabasco* sensu Lundell, Wrightia 2: 58. 1960 [not *Myrtus Tabasco* Schlecht. & Cham.]. *Pimiento*; *Pimenta gorda*; *Pimienta*; *Peensia* (Cobán, Quecchí?); *Pimienta de Chiapas*; *Pens* (Quecchí); *Ixnabacuc* (Petén, Maya, fide Lundell); *Pimienta de Jamaica*.

Common in moist or wet climax forest, usually on limestone, 350 meters or less; Petén; Alta Verapaz; cultivated commonly in fincas of Guatemala, or sometimes for ornament or for its fruit in parks, along streets, or about dwellings, at low and middle elevations. Southern Mexico, including the Yucatán Peninsula of Mexico; British Honduras; Central America; West Indies; perhaps northern South America.

A tree up to 20 meters high, 30 cm. in diameter, with pale brown bark peeling off in thin scales or rather large sheets; vigorously growing branchlets flattened and 4-angled, the angles terminating distally in the position of stipules; branchlets, inflorescence and young foliage closely appressed-pubescent with sordid or yellowish-white hairs, the hypanthium conspicuously canescent; leaves coriaceous, soon glabrate, ovate or elliptic, 3–9 cm. wide, 9–20 cm. long, mostly 2–3 times as long as wide; blades variable in shape, generally acute but the very tip obtuse or subacute, the base acute to rounded or even cuneate, the margins at base even on the broader leaves cuneately long-decurrent on the stout broadly channeled petioles 1.5–2 (–3) cm. long, 1.5–2.3 mm. in diameter; midvein deeply sulcate above, elevated its whole diameter beneath; lateral veins 9–12 pairs, distant, rather prominent beneath, stronger than the few intermediate ones, somewhat diminished distally and forming a connecting series of high irregular angular arches the bases of which may be as much as 1 cm. from the margin; minor veins forming a pale elevated network on the lower surface, the numerous glands conspicuous among them; inflorescence a myrcoid panicle 6–12 cm. long, many-flowered, 3 to 4 times compound, the peduncle 2–4.5 (–7) cm. long, up to 2.5 mm. wide below the first node; flowers mostly clustered near the tips, sessile but the lateral ones on short branches and so appearing pedicellate; bracts subtending the flower-clusters 1–2 mm. long, deciduous at anthesis; buds turbinate, 2.5–3.5 mm. long; calyx lobes 4, nearly equal, broadly rounded, concave, thinly pubescent without, densely canescent-tomentulose within, about 2 mm. wide, 1.5 mm. long; disk cup-shaped in flower, 2.5 mm. wide, the stamens interspersed with white hairs; style 4–5 mm. long, prominently capitate, the stigma twice as thick as the style; stamens about 150, up to 5 mm. long; petals white, suborbicular, about 5 mm. long; ovary bilocular, the ovules 1 (–2) in each locule; fruit subglobose or oblate to somewhat pyriform, (4–) 6–8 mm. in diameter, prominently verrucose with convex oil-bearing glands; seeds usually 2, laterally compressed, suborbicular, the embryo forming a double spiral.

In Jamaica the production of allspice has been an important industry. Those who regard the plant of Mexico and Central America

as a species distinct from the West Indian one point out that the commercial product from Mexico is held to be inferior to that of Jamaica; that the dried fruits of the mainland plants are larger than, and contain less than half as much volatile oil as, the Jamaican berries. It is apparently true that the West Indian plants have somewhat smaller flowers and fruits, and more slender panicles, than those of Central America, but in other respects they are scarcely distinguishable. The Central American populations have passed under a series of names based nomenclaturally on *Myrtus Tabasco* Schlecht. & Cham. Linnaea 5: 559. 1830, but that name applied to a Venezuelan plant which is probably not the same as the Central American ones. For a note on the nomenclature of *Myrtus Tabasco*, see Fieldiana, Bot. 29: 511–512. 1963.

It is interesting to note that this species, as suggested by its name, "dioica," is popularly supposed to produce male and female flowers upon different trees. This is, in fact, the origin of the Linnaean name "dioica," Linnaeus in 1754 having received from Philip Miller Jamaican specimens and a letter asserting the existence of the two types of flowers. Some botanists have denied vigorously the existence of two types of flowers in the tree, whereas others have stated categorically that the trees were polygamous or dioecious. Merrill (Contr. Gray Herb. 165: 30–38. 1947), in an article on the nomenclature of *Pimenta dioica*, reviewed a series of statements by horticulturists and others who knew the tree in the living condition; the evidence was somewhat contradictory, but the consensus was that some individual trees definitely are barren at least in certain years and perhaps always; that barrenness may result from damage to the plant because of wasteful methods of harvesting; that even the so-called "male" flowers are usually perfect, with well-developed stamens and pistil. Merrill suggested that barrenness in at least some individuals might result from a combination of genetically controlled factors producing seasonally late flowering and at the same time self-sterility.

The notes in the following paragraph are those of Mr. Standley: This is one of the most delightful of Central American trees because of the intense and highly agreeable odor that it exhales, whether fresh or dry. Most plants with characteristic odor lose it upon drying, but allspice specimens in the herbarium retain their fragrance indefinitely, and to such a degree that it is very apparent whenever the case containing the specimens is opened. The name allspice is derived from the fact that the spice furnished by the tree, consisting of the dried

unripe berries, is supposed to combine the flavor of cloves, cinnamon, and nutmeg. This fruit is much used as a condiment for flavoring food in most American and European countries, and it is sold commonly in Guatemalan markets. It is also employed to some extent in domestic medicine. In Guatemala the Indians often apply the powdered seeds to the corpses of children, saying that thus they are preserved indefinitely, a practice that probably is of very ancient origin. The trees may be seen in most of the small fincas of the country, easily recognizable even when sterile by the characteristic odor and by the distinctive bark, much like that of the guava. It is said that the bark is shed more or less regularly twice a year, but it always is peeling from the trunks, giving them a somewhat mottled appearance. When covered with its abundance of white flowers the tree is very handsome, conspicuous from a long distance, but the flowers last only a few days at most. The wood is tough and close-grained; heartwood reddish brown, the sapwood of a lighter color; of medium luster, very hard and heavy, fine-textured; finishes very smoothly. Probably no use is made of it locally.

PSIDIUM L.

References: Berg, Linnaea 27: 352–378. 1856; and in Mart. Fl. Bras. 14, pt. 1: 381–411. 1857; McVaugh, R., Fieldiana, Bot. 29: 512–529. 1963.

Calyx various, usually splitting irregularly down to the ovary in anthesis, its tube (hypanthium) prolonged beyond the summit of the ovary. Calyx-limb of 4–5 distinct teeth or lobes, or completely closed in the bud, or with an apical pore. Ovary 2- to 7-locular, the sporophores appearing to arise from the central axis of the ovary, mostly connate in pairs and simulating stalked axile bilamellate placentae. Petals often showy. Fruit often fleshy, many-seeded, sometimes large and edible. Seed hippocrepiform or reniform, with bony testa and uncinate or curved embryo. Inflorescence (in Guatemalan species) a 3-flowered dichasium, or the flowers solitary.

An American genus which according to Berg includes about 100 species. The type species, *P. Guajava* L., the guava (Sp. *guayabo*), is now widely naturalized throughout the tropics. A few species of somewhat doubtful status, not treated below, are reported from Mexico and from eastern Central America (Costa Rica).

Flowers at leafless nodes on old wood, sessile or slender-pedicellate, solitary or several at the same node in sessile glomerules or irregular groups; leaves subsessile or the petioles very short and stout, 1.5–2 mm. thick, 6 mm. long or less; leaves glabrous or essentially so at maturity, with rather numerous (10–15 or more) and parallel lateral veins on each side of the midvein; mid-

vein narrowly impressed on the upper surface; lowlands of the Atlantic Coast, Honduras to British Honduras.

Branchlets acutely 4-angled, the angles becoming winglike in the distal parts of the internodes and terminating in the stipular positions at the sides of the petioles; flowers sessile or nearly so, the pedicels 1 mm. long or less; ovary bilocular.

Plants, including the inflorescence, glabrous or essentially so.

Leaves subsessile, rounded to acute at base, 3–7 (–12) cm. long, mostly 1.6–2.3 times as long as wide; style 6–8 mm. long; stamens 60–75.

P. biloculare.

Leaves on petioles 3–5 mm. long, rounded or subauriculate at base, 12–20 cm. long, 3–3.5 times as long as wide; style 9–10 mm. long; stamens about 200.....*P. musarum.*

Young leaves and branchlets, and the inflorescence, coarsely silky- or velutinous-tomentose; leaves subsessile, abruptly rounded or subcordate at base, 6–10 cm. long, 2–3 times as long as wide; style 9–10 mm. long; stamens about 125.....*P. apodanthum.*

Branchlets terete or compressed, the nodes enlarged; plants glabrous; flowers pedicellate; calyx closed in the bud or with a small apical opening; style 5.5–7 mm. long.

Petioles 3–6 mm. long; pedicels 10–18 mm. long; buds 5–6 mm. long, apiculate, closed except a minute subapical pore; locules of the ovary 3 (–2), the ovules about 20 (–45) in each locule.....*P. anglohondurensis.*

Petioles 1–3 mm. long; pedicels 3–4 mm. long; buds 3–4.5 mm. long, sub-globose or pyriform, the calyx-lobes united their whole length but leaving an apical opening 1.5–2 mm. across; locules 2 (–1), the ovules about 50 in each locule.....*P. mouririoides.*

Flowers solitary or the peduncles 3-flowered, from the axils of foliage leaves on developing branchlets, or sometimes in the axils of small bracts at the lower nodes of developing leafy branchlets; lateral veins usually fewer than 10 on each side, often 5–8; plants of middle or sometimes low elevations, often cultivated or in disturbed habitats.

Lateral veins 12–20 on each side of the midvein, usually impressed above, prominent beneath and well differentiated from the small intermediate veins; herbage heavily pubescent especially when young with soft silvery-gray or pale reddish hairs; branchlets somewhat 4-angled or sometimes terete; buds closed, 10–16 mm. long; peduncles usually 1-flowered.....*P. Guajava.*

Lateral veins 5–10 on each side of the midvein, usually narrow and convex above, if more than 10 then very slender and scarcely differentiated (on the lower surface) from the intermediate veins; pubescence, branchlets and flowers various.

Lower leaf-surface hirsutulous or tomentose, the numerous hairs 0.5–1 mm. long, often obscuring the surface; inflorescence often 3-flowered.

Branchlets strongly 4-angled; leaves gray-tomentose beneath; lateral veins 5–9 on each side, ascending and parallel; flowers and buds unknown.

P. ×hypoglaucum.

Branchlets terete to compressed; herbage pale- or rufous-tomentose; lateral veins 6–10 on each side, arcuate-ascending, incurving toward the tips; buds 10–12 mm. long, closed or very nearly so at the tips.

P. guineense.

Lower leaf-surface glabrous or sparingly pubescent or strigose; inflorescence usually 1-flowered.

Leaves cuneate-obovate, mostly 2–5 cm. wide and 5–10 cm. long, obtuse or rounded or abruptly deltoid-acuminate at apex.

Branchlets compressed or terete; flower-buds always glabrous, about 8 mm. long, the calyx very shortly 4-lobed; pedicels stout, 1 mm. thick, 4 mm. long (up to 1.5 cm. long in fruit); style 6 mm. long, the broad peltate stigma 1.3–1.5 mm. wide; lateral veins 8–10 on each side; midvein flat or slightly impressed above; cultivated.

P. Cattleianum.

Branchlets strongly 4-angled; flowers unknown; peduncles 1- or 3-flowered, 1.5–2 cm. long; lateral veins 4–6 on each side; small veinlets forming a prominent reticulum; midvein convex above; probably a hybrid of unknown ancestry; see *P. chrysobalanoides* (p. 396), in discussion of *P. guineense.*

Leaves elliptic to ovate or somewhat obovate, rounded or acute at base.

Leaves mostly elliptic, about equally narrowed to both ends, the blades 5–12 cm. long, the petioles 5–8 mm. long; midvein impressed or sometimes merely concave above; buds 7–12 (–20) mm. long, closed, or the tips of the calyx-lobes minute, pressed together and simulating an apical pore; anthers 1.5–2 mm. long.

Plant completely glabrous, a shrub 60 cm. high or less; branchlets terete or compressed; leaves acute, usually cuspidate; buds 7–10 mm. long, the free tips of the calyx-lobes less than 0.5 mm. long; style 8–9 mm. long; fruit 1.5 cm. in diameter *P. Popenoei.*

Branchlets and inflorescence sparingly appressed-pubescent; branchlets often 4-angled; leaves acuminate; buds 8–12 (–20) mm. long, completely closed; style 13–15 mm. long; fruit up to 3–5 cm. long and wide *P. Friedrichsthalianum.*

Leaves ovate-lanceolate to ovate or elliptic, mostly 3–6.5 cm. long, the petioles 1–4 mm. long; midvein flat or somewhat convex above; buds 4–7 mm. long, closed or the calyx 4- or 5-lobed; anthers 0.4–0.8 mm. long.

Calyx openly 5-lobed, the lobes in mature buds broadly rounded or deltoid, 2.5–3 mm. wide, about half as long as the globe of the unopened petals; style 7–8 mm. long; leaves nearly sessile, the stout subpetiolar base 1–2 mm. long or less; a shrub or subshrub mostly less than 1 meter high *P. salutare.*

Calyx completely closed in the bud and then calyprate and circumscissile, or with 4 minute free lobes surrounding an apical pore, then opening by longitudinal fissures; style 4–5 mm. long; leaves with definite slender petiole 1.5–4 mm. long; a tree up to 12–15 meters high *P. Sartorianum.*

***Psidium anglohondurensis* (Lundell) McVaugh, Fieldiana, Bot.**

29: 521. 1963. *Eugenia Schippii* Standl. Field Mus. Bot. 11: 137. 1932, not *Psidium Schippii* Standl., 1931. *E. anglohondurensis* Lundell, Wrightia 2: 123. 1961.

Wet mixed forest or open pine forest, mostly near sea level; British Honduras, chiefly in pine forest, the type from Commerce Bight, Stann Creek District, *P. H. Gentle* 8354.

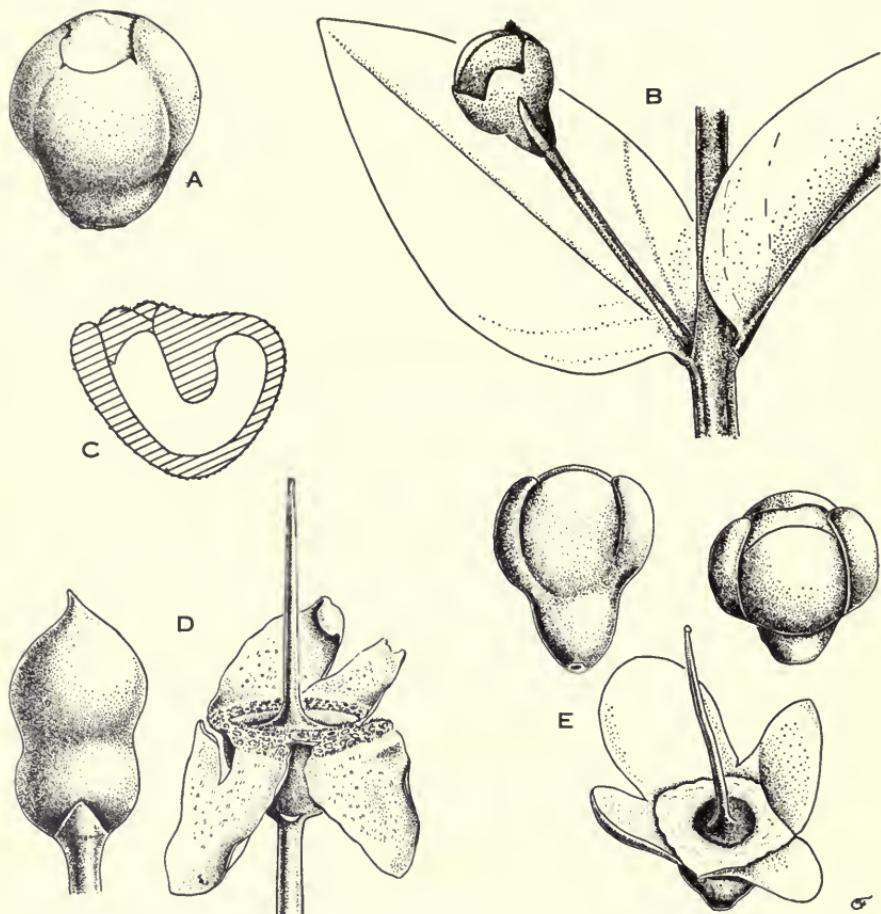


FIG. 54. Floral morphology in *Psidium*. A, Bud of *P. mouririoides* (Gentile 4142, type); $\times 5$. B, Axillary flower of *P. salutare*, showing open lobed calyx (Haught 2602); $\times 2.5$. C, Diagrammatic section of seed of *P. guineense*, showing curved embryo unshaded in center; $\times 10$. D, Bud and old flower of *P. anglo-hondurensis* (Bartlett 13060); $\times 5$. E, Lateral and terminal views of bud and old flower of *P. biloculare* (Gentile 3382); $\times 5$.

A tree, up to 7–8 meters high, 25 cm. in diameter, nearly glabrous, the vegetative buds sparingly reddish-strigose; bracts, bracteoles and petals ciliate, and the petals somewhat appressed-pubescent; staminal ring densely pubescent about the bases of the stamens with short red hairs; branchlets terete or compressed, with enlarged nodes; leaves elliptic, 3–5.5 cm. wide, 9–14 (–20) cm. long, 2.5–3 (–4.2) times as long as wide, gradually acuminate, the basal margins forming an acute angle or cuneately narrowed, usually decurrent on the very stout adaxially concave petioles 1.5–2 mm. thick, 3–6 mm. long; petioles in age transversely rimose, the papery outer layers flaking off; midvein impressed above; lateral veins rather numerous and parallel, 10–15 principal pairs in addition to some

intermediate ones, visible in dried leaves as fine lines on both surfaces, often slightly etched in on the upper surface; marginal vein evident, 2–3 mm. from the margins, about equaling the laterals but scarcely arched between them; blades dull green above, paler beneath, the minute glands scarcely visible above, less abundant but evident beneath; flowers at leafless nodes of 2- to 3-year-old twigs, 1–4 at a node, the pedicels 10–18 mm. long, 0.6 mm. in diameter (to 1 mm. in fruit), seeming to arise directly from the axillary region above the leaf-scar; buds 5–6 mm. long, apiculate, obovoid or constricted at the middle, closed except for a small ciliate subapical pore, the calyx splitting irregularly into 3–4 ovate or strap-like segments 3–5 mm. long, these up to 4 mm. wide, appressed-pubescent within near base; bracteoles scarious, broadly ovate-triangular, 0.6–1 mm. long and wide, deciduous about as the flower opens or somewhat persistent; disk 4–5 mm. wide, the center glabrous; style 6–7 mm. long, glabrous, subcapitate; stamens ca. 175, 6 mm. long, the anthers nearly 1 mm. long; petals white, 6 mm. wide, 8 mm. long; ovary 2- or 3-locular, the ovules about 20–45 in each locule, in a subcapitate group from an axillary bilamellate placenta; fruit "blue-black" (Schipp), globose, 1–1.5 cm. in diameter, the hard flesh 2–2.5 mm. thick when dry; seeds chocolate-brown, slightly rough, often 2 developing in a locule and then plano-convex, 7–8 mm. wide, curved into a nearly complete ring, the outer layer simulating a membranaceous testa but not separating from the bony inner layer surrounding the ring-like embryo more than 10 mm. long, 0.5 mm. in diameter.

Psidium apodanthum (Standl.) McVaugh, Fieldiana, Bot. 29: 520. 1963. *Eugenia apodantha* Standl. Field Mus. Bot. 17: 380. 1938.

Lowlands, forests, probably along rivers, to be sought in eastern Guatemala. Honduras (Dept. Comayagua, near Siguatepeque, Yuncker *et al.* 5766, the type).

A tree to 5 meters high, 7.5 cm. in diameter, the branchlets sharply 4-angled, the distal portions of the internodes bearing corky wings in the stipular positions; bark of older branchlets pale, checking in thin longitudinal small plates; young branchlets and petioles, and lower surfaces of young leaves, coarsely velutinous-tomentose with pale brown nearly erect sharp hairs up to 0.5–0.7 mm. long; flowers silky-tomentose with similar hairs; leaves subsessile, elliptic or elliptic-obovate, 2–4 cm. wide, 6–10 cm. long, 2–3 times as long as wide, the tips bluntly pointed or obscurely acuminate, the blades narrowed toward the base from the middle or below, then abruptly rounded or subcordate, the margins very shortly decurrent on the inner angles of the corky-rimose petiole 1.5–2 mm. thick, 2–2.5 mm. long; midvein deeply and narrowly impressed above; lateral veins 10–12 pairs in addition to some intermediate ones, inconspicuous above, rather prominent beneath; marginal veins about equaling the lateral ones and slightly arched between them, 1.5–2.5 mm. from the margin; blades obscurely glandular, sometimes punctate above; flowers sessile, 1–4 together in axillary clusters at leafless nodes, subtended by flat scarious bracts; buds obovoid, about 5 mm. long, broadly rounded at apex, the conic densely hairy canescent hypanthium 1.5 mm. long; calyx-lobes free from the first, bluntly ovate or linguiform, 3 mm. long, 2.5 mm. wide at base, tomentulose without, glabrous or sparingly tomentulose within, at anthesis separating down to the disk and then 4–6 mm. long, 2.5–4.5 mm.

wide, flat; disk 4–5 mm. wide, hairy in the staminal ring and about the base of the style; style (6.5–) 9–10 mm. long; stamens about 125, about as long as the style; petals white, obovate, 7 mm. long, delicately ciliate; ovary bilocular, the ovules about 20 in each locule, attached in a sessile subcapitate group above the middle of the central dissepiment; immature fruit crowned by the four somewhat irregularly shaped but nearly equal calyx-lobes; immature seeds suborbicular-reniform, laterally compressed, about 3 mm. wide, more than 1 mm. thick; testa bony; embryo C-shaped.

Psidium biloculare McVaugh, Fieldiana, Bot. 29: 520. 1963.
Eugenia Gentlei Lundell, Carneg. Inst. Wash. Publ. 478: 216. 1937.
Not *Psidium Gentlei* Lundell, 1943.

River banks, at low elevations; Izabal (Río Chacón, *H. Johnson* 1191). British Honduras, in pinelands (the type from Gracie Rock, Sibun River, Belize District, *P. H. Gentle* 1684).

Shrub or small tree to 20 cm. in diameter, glabrous except for a few coppery stiff hairs up to 0.4 mm. long on the inflorescence, on the vegetative buds and at the youngest growing nodes; branchlets, at least on the distal parts of the internodes, sharply wing-angled, the 4 corky wings terminating in the stipular positions at the bases of the petioles; leaves coriaceous, elliptic or especially on young shoots ovate, (1–) 1.5–2.5 (–4) cm. wide, (2–) 3–7 (–12) cm. long, 1.6–2.3 (–3) times as long as wide, broadly acuminate or merely obtuse at tip, gradually rounded to an acute base (abruptly rounded on shoots); blades almost sessile, the margins decurrent on the channeled petiolar base and often apparently extending into the axil, the base itself becoming corky, as seen from the abaxial side, 2–4 mm. long, up to 2 mm. thick; midvein impressed above; lateral veins about 10 pairs in addition to some intermediate ones, obscure on both surfaces; marginal vein obscure, about equaling the laterals and but slightly arched between them, ca. 1 mm. from the margin; blades dark green and probably lustrous above, paler beneath, the upper surface with numerous minute impressed glandular dots, the lower sparingly but evidently dark-dotted; flowers closely sessile, 1–2 together at leafy or leafless nodes, subtended by a pair of scarious rounded ciliate bracteoles about 0.8 mm. long and wide; bracts about the same size, scarious; buds pyriform, 4–5 mm. long, the small hypanthium conic; calyx-lobes 4, the free terminal parts rounded or ovate, 1 mm. long, 1–1.5 mm. wide at base, the calyx as a whole splitting at anthesis down to the margins of the disk and the lobes becoming 2–2.5 (–4) mm. wide at base, 2.5–4 (–5.5) mm. long; disk 2.5–4 mm. wide, glabrous or the staminal ring hairy; style 6–8 mm. long, subcapitate; stamens ca. 60–75, up to 8 mm. long; anthers 1 mm. long; petals rather narrowly obovate, ciliate, 5 mm. wide, 7 mm. long; ovary bilocular, the ovules about 20–30 in each locule, in a subcapitate group arising from the central dissepiment; fruit globose, oblate or somewhat pyriform, up to at least 1–1.2 cm. long and wide; seeds 1–2 in each locule, laterally compressed and hippocrepiform, 4–6 mm. wide, 1.5–2.5 mm. thick, notched at one side, the outer layer of the seed coat membranous, the inner bony; embryo C-shaped.

This species is difficult to distinguish from *P. apodanthum* except by the presence or absence of pubescence. It may be that additional

distinguishing features reside in the buds or flowers, but in *P. apodanthum* neither of these is known. Certain specimens from British Honduras (*Gentle* 5358), and from Izabal (*Steyermark* 38544) seem to be intermediate between the two species in having the calyx tomentulose but the plants otherwise essentially glabrous.

Psidium Cattleianum Sabine, Trans. Roy. Hort. Soc. 4: 315, t. 11. 1821. *P. littorale* Raddi, Opusc. Sci. Bologna 4: 254, t. 7, f. 2. ?1821. *Guayaba; guayaba japonesa. Strawberry guava.*

Cultivated around Cobán (about 1300 meters) and doubtless elsewhere in Guatemala; planted infrequently in Central America. Native probably of the lowlands of eastern Brazil.

A shrub or small tree, quite glabrous even to the vegetative buds, or the branchlets, leaves and pedicels minutely hispidulous-puberulent, the flower buds always glabrous; leaves cuneate-obovate, 1.5–6 cm. wide, 4–12 cm. long, 1.75–3 times as long as wide, the tip obtuse or rounded or sometimes obscurely acuminate, the base cuneate or sometimes acute, the margins decurrent on the rather short petioles 3–10 (–20) mm. long; midvein flat or slightly impressed above; lateral veins 8–10 on each side, inconspicuous, ascending and parallel, connected by a series of asymmetric angular arches forming a somewhat poorly defined marginal vein 1–3 mm. from the margin; flowers solitary and axillary, or at the lowermost leafless (bracteate) nodes of otherwise leafy branchlets, or rarely 2–3 pairs in raceme-like groups on short leafless branchlets; pedicels 4 mm. long (up to 8–15 mm. long in fruit), 1 mm. thick; bracteoles lance-ovate, 2.5 mm. long, ?deciduous; buds pyriform, about 8 mm. long, open at the end, the calyx with about 4 broad low rounded lobes, splitting in the sinuses into irregular lobe-like segments 5–6 mm. long and wide; style 6 mm. long, much narrower than the capitate eroded stigma 1.3–1.5 mm. wide; petals white, obovate; fruit ovoid or globose, 2.5–3.5 cm. long, purplish red or sometimes yellow, with a thin skin, the pulp white, sweet and aromatic, containing numerous hard compressed-triangular seeds 2–2.5 mm. long.

Called "cas dulce" in Costa Rica. For an account of the nomenclature of this species see F. R. Fosberg, Proc. Biol. Soc. Wash. 54: 179–180. 1941; C. A. Schroeder, Journ. Arnold Arb. 27: 314–315. 1946.

Apparently native plants from eastern Brazil, especially near the coast from Paraná to São Paulo, are usually glabrous; cultivated specimens from northern South America and Central America are often pubescent, and the leaves sometimes suggest by their size and shape a possible admixture of genes from *P. Sartorianum*.

Psidium Friedrichsthalianum (Berg) Ndzu. in Engl. & Prantl, Nat. Pflanzenfam. 3, Abt. 7: 69. 1893. *Calyptropsidium Friedrichsthalianum* Berg, Linnaea 27: 350. 1856.

Along the edges of tidal streams (Honduras), in forests, or in upland pastures or clearings, sometimes in cultivation; Santa Rosa (Santa Rosa, 900 m., Heyde & Lux 2984). Southern Mexico (Chinantla, Liebmamn 3993); Central America to Panama (the type collected at Granada, Nicaragua—not Guatemala as stated in the original description—by Friedrichsthal); Colombia.

A tree 6–10 meters high, the branchlets and inflorescence sparingly appressed-pubescent with sordid hairs; leaves glabrate; branchlets often 4-winged, the wings terminating distally in the stipular positions; leaves 2.5–5 cm. wide, 5–12 cm. long, 1.6–2 (–3) times as long as wide, mostly elliptic, about equally narrowed to the acuminate tip and the broadly acute or rounded base, the margins cuneately decurrent on the thin inner angles of the deeply channeled petiole 5–8 mm. long; midvein deeply and narrowly impressed; lateral veins 5–8 on each side in addition to some intermediate ones, ascending, diminishing distally, the marginal vein inconspicuous but well defined, arching, 1.5–4 mm. from the margin; blades when young membranaceous and resinous-dotted, at maturity sometimes gland-dotted, the midvein on the lower surface bearing prominent convex glands; flowers solitary (rarely with sessile central flower and a pair of pedicellate lateral flowers forming a dichasium), axillary or in 1–2 bracteate pairs at the lower (leafless) nodes of leafy branchlets; bracteoles narrow, deciduous, 1.5 mm. long; pedicels 10–20 mm. long, 1–1.3 mm. thick; buds closed, mostly ovate or obovate, 8–12 mm. long, acute at the base, broadly rounded at the apex and blunt or apiculate, breaking irregularly through the apex or near it into 1–3 broad lobe-like or hooded segments [buds sometimes pyriform, 15–16 (–20) mm. long including the narrowly obconic hypanthium 5 mm. long, the subglobose body 8–9 mm. long and the subulate apiculum 2 mm. long; pedicels in these buds up to 3–4 cm. long]; style 13–15 mm. long, the stigma much wider than the style, 1.5 mm. wide, flat or concave; stamens very numerous, probably about 300, up to 12 mm. long; anthers linear-oblong, 1.6–2.1 mm. long; petals about 15 mm. long; fruit globose or oval, up to 3–5 cm. long and wide, yellow, acid; seeds laterally compressed, 5–6 mm. long.

Called “arrayán” (El Salvador); “guayaba de danto” or “guayaba agria” (Honduras); “cas” (Costa Rica); “guayaba de agua” (Panama). Mr. Standley states that although the fruit is edible it is so sour that it is not agreeable to most people.

Psidium Guajava L. Sp. Pl. 470. 1753. *Guayaba* (fruit); *guayabo* (plant); *pataj*, *patá* (Quechí); *cac* (Poconchí); *ch'amxuy* (Ixil); *piac* (Cacchiquel, Antigua); *ikiec* (Cacchiquel, Tecpam).

Mostly in moist or dry thickets, especially in pastures, frequently forming almost pure stands of considerable extent, 1800 meters or less, most common at 1000 meters or lower; planted generally; probably found in every Department of Guatemala. Florida; Mexico; Central America; Costa Rica and Panama; West Indies; tropical South America; naturalized in the tropics of the Old World.

A shrub or tree up to 10 meters high, pubescent on the young growth, and the inflorescence and at least the lower surface of the leaves sparingly or densely pubescent with mostly appressed, soft silvery-gray or pale reddish hairs up to about 0.5 mm. long; branchlets terete, or quadrangular with pronounced angles or low wings below the nodes; leaves elliptic or oblong, 3–6 cm. wide, (4.7–) 8–14 cm. long, mostly 2–3 times as long as wide, rather abruptly rounded or occasionally narrowed to the obtusely pointed or rounded tip, the base abruptly rounded or subcuneately narrowed, the margins decurrent on the stout petiole 1–2 mm. thick, 4–7 (–10) mm. long; veins prominent beneath, usually markedly impressed above; lateral veins 12–20 pairs, often conspicuous and parallel, not forming a marginal vein but diminishing distally, each approaching to within 1–2 mm. from the margin, then incurving and joined to the next succeeding vein by a strong straight perpendicular vein; upper surface of blade inconspicuously gland-dotted, glabrous or thinly pubescent, the small veins little or not at all elevated and scarcely apparent; lower surface finely appressed-pubescent or glabrous, thickly gland-dotted; inflorescence axillary, 1-flowered (very rarely 3-flowered), the peduncle (7–) 10–20 (–25) mm. long, 1 mm. or more thick, up to 2.5 mm. thick in fruit; bracteoles subulate, often glabrous, 3–4 mm. long; buds at maturity 13–16 mm. long, completely closed at tip, the hypanthium 5–7.5 mm. long, constricted at summit and thence enlarged into the ovoid pointed calyx; calyx at maturity splitting irregularly into 4–5 lobes which are appressed-pubescent distally; proximal third of the calyx, and the summit of the ovary, glabrous; style 10–12 mm. long, the flat peltate stigma 0.5 mm. wide; petals white, elliptic, cucullate, 10–12 mm. long; stamens 150?–275, the longest as long as the style; anthers 0.8–1.2 mm. long; fruit globose or pyriform, 2–6 cm. long, yellow or pinkish.

The following notes were supplied by Mr. Standley: The Maya name of Yucatán is "pichi"; sometimes called "coloc" and "putah" in British Honduras, and the name "pichi" also is used there by Maya-speaking people. The name "guayaba" is of Antillean origin. It occurs in many place names of Guatemala, such as El Guayabo, Los Guayabales, etc. The tree is a very common one in the lowlands of Guatemala, often forming pure stands called *guayabales*. The fruits are eaten by many animals, and it is probably on this account that the seedlings are spread so widely, the hard seeds being indigestible. It is noteworthy that the young plants spring up in perhaps greatest abundance in cattle pastures. The wood is brown or light brown. It is little used except for firewood, but in Guatemala spinning tops sometimes are made from it. In El Salvador it is utilized for fine-toothed combs, but these, when wet, are inclined, even when well polished, to disintegrate or shed their fibers; hence the wood of Salamo (*Calycophyllum*) is preferred for the purpose. The bark is employed in some parts of Mexico, and perhaps also of Central America, for tanning leather. A decoction of the leaves is astringent, and is administered as a remedy for diarrhea. The fruit of the guava is highly esteemed in Guatemala, and in most other

regions where it grows, in spite of its very strong and not altogether pleasant odor. Vast quantities of the fruits are eaten raw by children and older people, but enough is left, so great is the production, for a great variety of mammals and birds. In Guatemala the fruits are not common in most of the markets, probably because most people have an ample supply at or near home. The fruits are stewed and often served as a dessert. Their most important use is in preparation of the thick jelly or guava paste which, cut in thin squares, is one of the favorite and most common desserts of all Central America. The fruits vary greatly in shape, size, and flavor, some being rather acid.

***Psidium guineense* Sw. Prodr. 77. 1788. *P. Araca* Raddi, Mem. 5, t. 1 [Op. Sci. 4: 854?]. 1821. *P. molle* Bertol. Nov. Comm. Acad. Bonon. 4: 422. 1840 (type collected in Guatemala by J. Velásquez). *P. costa-icense* Berg, Linnaea 27: 368. 1856 (type from Irazú ["Iaru"], Costa Rica, Oersted 17). ?*P. Schiedeanum* Berg, l.c. (type from Mexico, Schiede 541). *P. laurifolium* Berg, Linnaea 27: 364. 1856 (type from Masaya, Costa Rica, Oersted). ?*P. monticola* Berg, in Oerst. Vid. Medd. Kjøeb. 1855: 11. 1856-57. *Guajava mollis* (Bertol.) O. Ktze. Rev. Gen. 1: 240. 1891. *P. rotundifolium* Standl. Field Mus. Bot. 8: 318. 1931 (type from All Pines, British Honduras, W. A. Schipp S85). *P. Schippii* Standl. l.c. 319 (type from All Pines, British Honduras, Schipp 595). *Guayaba agria*; *guayaba ácida*; *guayaba hedionda*; *chamach* or *chamacch* (Quechchí); *pataj* (Cobán, Quechchí); *guayaba*; *arrayana*; *pichippul* (Petén, Maya, fide Lundell).**

Wet to dry thickets or open forest, often in oak or pine forest, frequently on rocky open hillsides or plains, 2400 meters or less, mostly at middle elevations; Petén; Alta Verapaz; Baja Verapaz; El Progreso; Izabal; Zacapa; Chiquimula; Jalapa; Jutiapa; Santa Rosa; Guatemala; Sacatepéquez; Chimaltenango; Quiché; Huehuetenango; Quezaltenango. Mexico (Sinaloa to Oaxaca; San Luis Potosí to Chiapas; Quintana Roo); British Honduras; Central America to Panama; West Indies (Jamaica; Martinique; Trinidad); throughout tropical South America to northern Argentina.

A shrub 1-2.5 meters tall or occasionally a small tree up to 7 meters high, usually heavily pubescent on the young growth, the inflorescence, and at least the lower surface of the leaves with erect, soft, flexuous, pale- or coppery-red hairs up to 1 mm. long; branchlets nearly terete to moderately compressed, rarely with definite angles below the leaf-bases; leaves broadly elliptic or sometimes obovate, (2.7-) 4-6 (-8) cm. wide, (3.5-) 6-10 (-14) cm. long, (1-) 1.6-2.3 (-3) times as long as wide, abruptly narrowed about equally to the rounded base and to the

rounded or obtusely pointed apex, or narrowed gradually from above the middle toward the often asymmetrical rounded or rarely subcuneate base; margins decurrent on the stout petiole 1–2 mm. thick, 5–10 mm. long; midvein slightly impressed above; lateral veins 6–10 on each side, when dry convex on the upper surface like the small veinlets, prominent beneath, strongly ascending, not forming a marginal vein but each lateral decreasing distally, curving toward the tip of the leaf, and inward, from a point 1–2 mm. from the margin, sometimes connected to the next lateral by a strong straight perpendicular vein near the tip; upper surface of leaf inconspicuously gland-dotted, usually somewhat pubescent (at least with a line of reddish hairs along the midvein), often with numerous evident small veins which are slightly elevated when dry and form a pattern (readily visible with the unaided eye) at right angles to the midvein and at an acute angle to the lateral veins; lower surface persistently pubescent, thickly and conspicuously gland-dotted; inflorescence an axillary dichasium, often 3-flowered but 1-flowered in some axils, or in some plants all 1-flowered; peduncle (12–) 17–32 mm. long, 1–2 mm. wide near summit and there somewhat compressed; central flower sessile or nearly so, the two lateral ones on pedicels 8–12 mm. long; bracts and bracteoles linear or subulate, about 3 mm. long, or the bracts leafy and up to 1.5 cm. long; bracteoles often with abortive axillary buds; buds at maturity 10–12 mm. long, incompletely closed at tip, the hypanthium 4–5 mm. long, constricted at summit and thence enlarged into the obtusely pointed or nearly globose calyx; calyx at maturity splitting irregularly into 4–5 lobes which are appressed-pubescent distally; proximal third of the calyx, and the summit of the ovary, glabrous; style glabrous, 7–11 mm. long, the flat peltate stigma 0.5 mm. wide; petals white, elliptic, cucullate, 10–14 mm. long; stamens about 150–200, as long as the style or shorter; anthers 1.2–2.2 mm. long; fruit globose or pyriform, 1–2 cm. in diameter, yellowish-green or yellow, barely edible.

A most variable species, usually a shrub but sometimes a small tree, often confused in herbaria with the common and much cultivated guava, *Psidium Guajava*. It is probable that these two species hybridize in nature, with the production of individuals intermediate in various ways. Ordinarily the two may be distinguished, as noted in the key, by the average number of veins in the leaves, by the degree to which the lateral veins are impressed, and by the degree of prominence of the small veins of the leaves in dried specimens. Additional useful distinguishing features may be found in the number of flowers (usually 1 only in *P. Guajava*, often 3 in *P. guineense*), the larger and more pointed and completely closed buds of *P. Guajava*, the longer peduncles of *P. guineense*. A detailed revisionary analysis in the field and in the herbarium, of the complex centering around these two species would be a valuable contribution to the taxonomy of tropical cultivated plants.

It is probable that the following species, *Psidium × hypoglaucum* Standl., has resulted from hybridizations between *P. guineense* and *P. Guajava*. For notes on this and the other three species described

by Standley in 1931, from a single locality in British Honduras, see *Fieldiana, Bot.* 29: 522–524. 1963. These four species were all based on fruiting specimens; Standley in differentiating them emphasized the differences in leaf-form but did not compare them to *P. guineense*, which they all strongly resemble. The most distinctive is *P. chrysobalanoides* Standl. (*Field Mus. Bot.* 8: 319. 1931), which is nearly glabrous, with 4-angled branchlets and obovate-cuneate leaves 2.5–5 cm. wide, 4–7.5 cm. long. The proper taxonomic disposition of this plant can only be determined by additional specimens.

According to unpublished notes by Mr. Standley, *P. guineense* is a very common shrub in many parts of Guatemala, and is native through most of the country. It is rarely if ever cultivated; the fruits are smaller than those of the edible guava, and too bitter or resinous to be palatable. The specific name is an unfortunate one, given by Swartz under the erroneous belief that the plant had been imported into Santo Domingo from West Africa.

***Psidium ×hypoglaucum* Standl.** *Field Mus. Bot.* 8: 320, pro spec. 1931. *P. guineense* Sw. × *P. Guajava* L.

Open rocky slopes, brushy hillsides, meadows and pastures, sometimes in pine-oak forest, often in disturbed grounds, 1000 meters or less; Jutiapa (Cerro Colorado, just west of Jutiapa, Standley 76173, 76190). Mexico (Chiapas); British Honduras, the type from All Pines, W. A. Schipp S99; Honduras.

A shrub 40 cm. to 1 meter high, the branchlets thinly pale-pubescent and strongly 4-angled; leaves densely and softly gray-tomentose beneath, the surface obscured by the matted hairs; blades elliptic-obovate on shoots, often obovate and cuneate at base; on slowly growing flowering branchlets often elliptic and somewhat rounded at base; blades 2–5 cm. wide, 3.5–9 cm. long, 1.5–2 times as long as wide, the petioles 3–6 mm. long; midvein impressed above; lateral veins 5–9 on each side, strongly ascending and parallel, forming with the veinlets, on the upper surface of dried leaves, a reticulum very like that in *P. guineense*; inflorescence 3-flowered, on a peduncle up to 3.5–5 cm. long, or in some plants 1-flowered, the peduncle 1–1.5 cm. long; flowers and buds unknown; fruit globose, 2–2.5 cm. in diameter, said to be sour.

Most individuals of this so-called species bear a strong superficial resemblance to plants of *P. guineense*, but usually exhibit also some features of *P. Guajava*, especially the gray pubescence of the leaves and the 4-angled branchlets. The lateral veins of the leaves suggest those of *P. Guajava* in being almost parallel, but are 5–9 in number, suggesting in this respect *P. guineense*. The hybrid nature of this plant is suggested by its morphological intermediacy and by

its common occurrence in disturbed habitats where both of the supposed parent species grow. Experimental confirmation of its hybrid nature is much to be desired.

Psidium mouririoides (Lundell) McVaugh, Fieldiana, Bot. 29: 521. 1963. *Eugenia mouririoides* Lundell, Amer. Midl. Nat. 29: 480. 1943.

British Honduras, known only from the type, collected in hammock on pine ridge, Toledo District, Monkey River, Jenkins Creek, P. H. Gentle 4142.

A small tree, 12 cm. in diameter, glabrous, the branchlets terete or compressed, with enlarged nodes; leaves coriaceous, broadly elliptic, 2–5 cm. wide, 4.5–10 cm. long, 1.6–2.5 times as long as wide, acuminate with depressed tip, rounded at base, the margins decurrent on the very stout adaxially concave petiole 1.5–2 mm. thick, 1–3 mm. long; midvein impressed above; lateral veins 10–15 pairs in addition to some intermediates, inconspicuous on both surfaces; marginal vein about equaling the laterals, scarcely arched between them, 1–2 mm. from the margin; blades dull green above, paler beneath, the upper surface with many minute impressed glandular dots, the lower sparingly dark-dotted; flowers 1–3 together at leafless nodes, on slender pedicels 3–4 mm. long; expanding buds sub-globose or short-pyriform, 4-sulcate, open at the tips, the calyx-lobes united their whole length except at the convex, ciliate apical margins surrounding a rounded or quadrate opening 1.5–2 mm. across; calyx at anthesis splitting longitudinally, somewhat irregularly into 4 ovate lobes 3 mm. long and about as wide at base; disk 4.5 mm. wide, the staminal ring hairy; style about 5.5 mm. long, scarcely subcapitate; hypanthium broadly cup-shaped, closely invested by a pair of conate-perfoliate scarious rounded bracteoles up to 1.5 mm. wide, 1–1.5 mm. long; stamens about 125, up to 6 mm. long, the anthers 0.8 mm. long; petals suborbicular, white, ciliate, about 6 mm. wide, up to 7 mm. long; ovary bilocular, the ovules about 50 in each locule, ascending, in a subcapitate group arising from the central dissepiment [this seen in one bud only; in 2 buds the ovary was unilocular, with ca. 50 ovules attached laterally]; fruit not seen.

Called "wild guava" in British Honduras.

This species is presumed to belong to the genus *Psidium* because of the characteristic way the opening calyx splits as the flower expands, and because the plant is extraordinarily like *Psidium anglo-hondurens*e, which grows in the same region. Final confirmation of its generic status must await the discovery of fruiting specimens. The unilocular ovary found in two out of three buds taken from the type specimen of *P. mouririoides* may be an anomaly, or perhaps an indication of evolutionary specialization in this species.

Psidium musarum (Standl. & Steyermark) McVaugh, Fieldiana, Bot. 29: 521. 1963. *Eugenia musarum* Standl. & Steyermark. Field Mus. Bot. 22: 358. 1940.

In wet forests, 350 meters or less; Izabal (Río Juyamá, about 15 miles southwest of Bananera, Steyermark 39165, the type); Alta Verapaz.

Shrub 2.5 meters high, glabrous, the branchlets acutely 4-angled, the angles terminating distally in the stipular positions; leaves elliptic or elliptic-lanceolate, 4–6.5 cm. wide, 12–20 cm. long, 3–3.5 times as long as wide, slenderly acuminate, rounded or subauriculate at base, the cartilaginous margins abruptly decurrent on the acute inner angles of the broadly concave petioles 3–5 mm. long; midvein narrowly impressed above; lateral veins 10–12 on each side in addition to some intermediate ones, inconspicuous above, apparent beneath; marginal vein about equaling the lateral ones and but little arched between them, 2–8 mm. from the margin; blades dull dark green above, pale beneath; pale resinous glands sometimes apparent among the pale translucent cells of the lower surface; flowers solitary or in pairs, in small sessile glomerules at leafless nodes, the pedicels less than 1 mm. long and about as thick as long; bracteoles rigidly coriaceous, obtuse, connate, reddish, forming a boat-shaped cupule 2–2.5 mm. long, nearly 1 mm. wide and high; buds not seen; hypanthium broadly campanulate or cup-shaped, in anthesis 2–3 mm. long and wide; calyx-lobes in bud free at the tips, the longer ones ciliate for about 3 mm. from the tips; calyx splitting between the lobes in anthesis, the splits extending 1–1.5 mm. below the sinuses, the lobes after anthesis rotate, oblong-ovate, blunt, 2.5–4 mm. wide at base, 3–4 mm. long; disk 3–4.5 mm. wide, quadrate, the petal-scars shallowly deltoid, prominent at the corners of the disk; style 9–10 mm. long, tapering to a small capitate stigma; stamens about 200, about as long as the style; anthers 0.7 mm. long; petals white, 4, broadly obovate or suborbicular, 6–7 mm. long, ciliate; ovary bilocular, the ovules 5 in each locule, pendent or radiating from a centrally located placenta, apparently flat or C-shaped; fruit "dull blue" (Steyermark), globose or oblate, 10–12 mm. in diameter.

Psidium Popenoei Standl. *Ceiba* 1: 41. 1950.

Savannahs and pine forests, about 1000 meters or less; to be expected in eastern Guatemala. Honduras (Dept. Santa Bárbara, on Río Chamelecón, Standley & Lindelie 7502; Dept. Comayagua, near Siguatepeque, Standley & Chacón 6369, the type).

A shrub 50–60 cm. high, quite glabrous even to the young growth, the branchlets terete or compressed; leaves elliptic, about equally narrowed to the acute and often cuspidate tip, and to the somewhat rounded or acute base, 2–4.7 cm. wide, 6–11 cm. long, about 2–3 times as long as wide; margins often rather long-decurrent on the sharp inner angles of the broadly channeled petiole 5–8 mm. long; midvein impressed above, sometimes merely concave; lateral veins 5–8 on each side, ascending, prominent on both sides but elevated and conspicuous beneath, much stronger than the intermediate ones if any, diminishing distally and incurving about 1 mm. from the margin to join the next succeeding ones; blades darker green and lustrous above, dotted beneath with many small resinous glands, sometimes impressed-punctate above especially in age; flowers solitary in the axils of foliage leaves, the peduncles compressed, slightly clavate in fruit, 1–2 cm. long, 1 mm. thick; bracteoles not seen, falling before the buds mature and leaving a scar at the base of the hypanthium; buds pyriform, 7–10 mm. long, obtuse, the calyx

almost completely closed, its tip with a minute pore surrounded by the approximate tips of 4–5 incurved lobules less than 0.5 mm. long; calyx in anthesis breaking irregularly, longitudinally, splitting its whole length into 3–5 variously shaped but mostly strap-like segments up to 6 mm. wide and 8 mm. long, the sinuses finally extending to the margin of the staminal ring; disk 4 mm. wide, sometimes 5-angled, the angles marked by 5 prominent petal-scars, these lenticular or shallowly triangular, 1.5 mm. long; style 8–9 mm. long, capitate; stamens very numerous, about 300; petals white; ovary about 4-locular, the stalked bilamellate placentae seeming to arise from the inner angles of the locules, bearing numerous ovules; fruit globose, 1.5 cm. in diameter, the many straw-colored seeds with bony testa, somewhat laterally compressed, 3–3.5 mm. long, the embryo C-shaped.

Called in Honduras "guayabillo," "guayabo," "arrayán," or "huevo de gato."

Psidium salutare (HBK.) Berg, Linnaea 27: 356. 1856. *Myrtus salutaris* HBK. Nov. Gen. & Sp. 6: 132 [folio ed. 105]. 1823. *P. ciliatum* Benth. Hook. Jour. Bot. 2: 318, as to type [Schomburgk 365]. 1840. *P. salutare* α *stricta* Berg, l.c. ?*P. salutare* β *laxum* Berg, l.c. 357. *P. salutare* γ *subalternum* Berg, l.c. 357, at least as to lectotype [Schomburgk 365]. *Calycolpus parviflorus* Sagot, Ann. Sci. Nat. VI. 20: 181. 1885. *P. Gentlei* Lundell, Amer. Midl. Nat. 29: 483. 1943.

Savannahs, pine ridges, and rocky or grassy hills, 1000 meters or less. British Honduras, Toledo District, Monkey River, Jenkins Creek, open pine ridge, *P. H. Gentle* 4062, type of *P. Gentlei*. Mexico (Nayarit, Rose 1950; Chiapas); Central America; Panama; Colombia to the Guianas; Isle of Pines; Hispaniola.

A small shrub or sub-shrub 30–50 (–100) cm. high from stout and often gnarled woody roots, the whole plant glabrous (the youngest leaves sometimes ciliate, the calyx-lobes ciliate and also appressed-pubescent within);¹ leaves nearly sessile, subcoriaceous, ovate-lanceolate to ovate or elliptic, 1–3 cm. wide, (2–) 3–6.5 cm. long, 1.8–3.5 times as long as wide, the tip acute or acuminate, usually appearing sharp-pointed to the unaided eye; base rounded and the margins rather abruptly decurrent on the stout subpetiolate base 1–2 mm. long or less; midvein flat or somewhat convex above; lateral veins inconspicuous, 5–10 pairs in addition to some intermediate ones, arching into an ill-defined marginal vein 1–2 mm. from the margin; blades dark green above, paler and often drying dull and brown beneath; glands usually evident beneath as minute dots; inflorescence axillary, rarely 3-flowered with the terminal flower sessile, the flowers usually solitary in the leaf-axils or near the base of the branch in the axils of much reduced leaflike bracts;

¹ Authors generally, including Kunth, Berg and Amshoff, state that the branchlets are, or may be, puberulent or pubescent. The South American and most Central American specimens I have seen are quite glabrous, including the branchlets. Some North American specimens, on the other hand, are notably pubescent on the branchlets and peduncles. Plants otherwise most like the South American ones, e.g. *Gentle* 4062, have the foliage quite glabrous from the first, even when the branchlets are pubescent.

pedicels 1.5–2.5 cm. long, compressed distally and there up to 1 mm. wide in fruit; bracteoles linear, deciduous soon after anthesis, up to 1 mm. wide, 4–6 mm. long; buds 6–6.5 mm. long, pyriform, abruptly expanded above the conic base; calyx deeply 5-lobed, about half as long as the globe of the petals in mature buds, the lobes broadly rounded, 1.5–2.5 mm. high, 2.5–3 mm. wide, somewhat separated in anthesis by irregular longitudinal ruptures in the sinuses between them; disk 4–5 mm. wide, glabrous; style 7–8 mm. long, capitate; stamens very numerous, probably about 250, about as long as the style and the petals; anthers broadly oval, about 0.8 mm. long; petals white, 6–7 mm. long; ovary 3-locular, the ovules biseriate, inwardly directed from an axile stalked placenta; fruit subglobose, when dry about 1 cm. in diameter, said to be of good flavor.

Amshoff, in the *Flora of Panama* (Ann. Missouri Bot. Gard. 45: 196. 1958), reduced *Psidium Oerstedeanaum* Berg (Linnaea 27: 360. 1856) to the synonymy of *P. salutare*. The original specimens of *P. Oerstedeanaum* came from Costa Rica (not Guatemala as mistakenly reported by Berg; see Fieldiana, Bot. 29: 524. 1963). Most Central American plants identified as *P. Oerstedeanaum* seem to have been merely pubescent specimens of *P. salutare*. Some plants, however, with obovate or elliptic and rather prominently veiny leaves, strongly pubescent stems and peduncles and canescent buds, seem to represent hybrids between *P. salutare* and another species of *Psidium*, perhaps *P. guineense*. Probably *P. Oerstedeanaum* Berg originated in this way. A recently described species from Chiapas, *Psidium chiapasensis* Lundell (Trapichito, near Comitán, Matuda 5769, type), is doubtless a synonym of *P. Oerstedeanaum* and similarly of hybrid origin. The supposed hybrids resemble for the most part small-leaved and gray-pubescent specimens of *P. guineense* (the leaves 3–6 cm. long), but the open 5-lobed calyx is that of *P. salutare*.

Typical *Psidium salutare* seems to be unknown from Guatemala. Specimens of what is probably a hybrid between *P. salutare* and some other species are known from several localities. All the plants are characterized by the collectors as depressed or procumbent shrubs 60 cm. high or less. The specimens are variable as to amount of pubescence and as to width of leaves. The calyx is more nearly closed than in *P. salutare*, but is very shortly 5-lobed from the beginning. The following specimens may be cited:

Open gravelly or rocky slopes, rocky summits, and pine forests, 800–1500 meters; Huehuetenango (Steyermark 51656); Chiquimula (Steyermark 30553); Jutiapa (Standley 76270).

Leaves elliptic-oblong, 2–6 cm. long, 2–3 times as long as wide, rather sparingly pubescent at maturity, gland-dotted beneath, sharply apiculate, the petioles 1–3 mm. long; flowers solitary on slender pedicels 2–3 cm. long, the buds canescent, 7–8 mm. long, slightly open at the tip, the calyx-lobes 5, free about 1 mm. at the

tips, the calyx splitting down between the lobes so as to make them apparently 2 mm. high and 3 mm. broad just before anthesis, then finally splitting irregularly to the base; fruit unknown.

Psidium Sartorianum (Berg) Ndzu. in Engl. & Prantl, Nat. Pflanzenfam. 3, Abt. 7: 69. 1893. *Mitranthes Sartoriana* Berg, Linnaea 29: 248. 1858. *Calycorectes protractus* Griseb. Cat. Pl. Cub. 284. 1866. *Calyptropsidium Sartorianum* (Berg) Krug & Urban ex Urban, Bot. Jahrb. 19: 571. 1895. *Calyptranthes Tonduzii* Donn. Sm. Bot. Gaz. 23: 245. 1897 (type from near San José, Costa Rica, *Tonduz* 9822). *Psidium microphyllum* Britton, Sci. Surv. P. R. & Virgin Is. 6: 555. 1930 (type a cultivated plant from Puerto Rico). *Mitropsidium Sartorianum* (Berg) Burret, Notizbl. Bot. Gart. Berlin 15: 487. 1941. *M. ob lanceolatum* Burret, l.c. (type from Santa Marta, Colombia, H. H. Smith 403). *M. Pittieri* Burret, l.c. 488 (type from near Caracas, Venezuela, Pittier 9277). *Psidium yucatanense* Lundell, Contr. Univ. Mich. Herb. 7: 35. 1942 (type from Belize District, British Honduras, P. H. Gentle 9). *P. Solisii* Standl. Field Mus. Bot. 23: 133. 1944 (type from Costa Rica, F. Solis 509). ?*Psidium Molinæ* Amshoff, Act. Bot. Néerl. 5: 277. 1956 (type from Dept. Morazán, Honduras, Standley 21255). *P. Sartorianum* var. *yucatanense* McVaugh, Fieldiana, Bot. 29: 527. 1963.

Forests and savannahs, in a wide variety of habitats from shade to full sun, 1500 meters or less; Chiquimula (Montaña Castilla, southeast of Quezaltepeque, Steyermark 31257). Mexico (Oaxaca to Jalisco and Sonora; Veracruz, *Sartorius*, the type; Chiapas; Yucatán); British Honduras; Honduras; El Salvador; Costa Rica; Panama; West Indies (Cuba); northern Colombia and Venezuela.

A tree up to 12–15 meters high and 30 cm. in diameter, with smooth mottled bark, the branchlets and inflorescence more or less hirtellous-puberulent with pale sharp crisped or often antrorse hairs up to 0.4 mm. long; leaves small (5 cm. long or less), elliptic to ovate or occasionally obovate, usually narrowed about equally to both ends, the tip from short-acuminate to acute or obtuse, the base acute to rounded or cuneate, the margins cuneately or somewhat abruptly decurrent on the compressed and distally dilated petiole 1.5–4 mm. long; midvein convex above, often pubescent in young leaves; lateral veins 5–8 pairs, in addition to some intermediate ones, evident but rather inconspicuous on both surfaces, ascending; marginal vein about equaling the laterals, arched between them, 0.5–2 mm. from the margins; leaves at flowering time thin, drying flat, usually darkening in drying, paler beneath and with more prominent glands; blades at full maturity quite different in aspect, coriaceous, drying pale green and often nearly concolorous, lustrous and usually pale-mottled above, the margins pale and strongly revolute, the lower surface thickly beset with pale and often convex glands; peduncles solitary, axillary (near the base of the branchlet sometimes in the axils of much-

reduced foliaceous bracts), 7–12 mm. long and 1-flowered, or more often cymosely 3-flowered, the central (terminal) flower sessile, the lateral ones on branches up to 7–8 mm. long; peduncles slender, somewhat compressed and up to 1 mm. wide near apex, in 3-flowered dichasia often up to 2 cm. long; buds pyriform, 4–5.5 mm. long, glabrous, contracted at base into a conic pseudostalk 0.5 mm. long, the distal portion subglobose or ovoid, closed except a minute apical pore which bears a few projecting hairs, often prolonged into a narrow apiculate tip up to 0.5 mm. long; bracteoles linear, soon deciduous; calyx calyptrate, circumscissile at about the level of the summit of the ovary, the conic or broadly dish-shaped calyptora somewhat persistent by one side; calyx appressed-pubescent within, splitting further by irregular longitudinal breaks, into (usually 4) recurved lobes up to 1.5 mm. long; style about 4–5 mm. long, pilose near the base, capitate; stamens about 100, up to 5 mm. long, the anthers 0.4–0.5 mm. long; petals 1–4, white, concave, suborbicular, 2–4 mm. long, sometimes one or more reduced in size; ovary (2–) 3-locular, the ovules about 20 in each locule, uniseriate, centrally directed from the margins of a bilamellate axile placenta; fruit globose or pyriform, 1–1.5 cm. in diameter, light yellow, resembling a guava in taste and color but with thin flesh 1–2 mm. thick; seeds 1–2 in each locule, with bony testa and C-shaped embryo, up to 7–8 mm. long.

This tree seems to be very little known in Guatemala, although it is a common and easily recognized forest tree throughout most of southern and western Mexico, and is known from various localities elsewhere in Central America.

In British Honduras and Yucatán and in Petén, this species is represented by a scantily pubescent or essentially glabrous population with rather long-acuminate leaves of a lanceolate type. This is *Psidium Sartorianum* var. *yucatanense* McVaugh (*P. yucatanense* Lundell). This variety is found also in Cuba, whence it was originally described as *Calycorectes protractus* Griseb. Specimens from the Yucatán Peninsula can often be distinguished at once from other Mexican and Central American specimens, most of which have short-pointed or obtuse leaves that tend to be elliptic rather than lanceolate.

Another segregate of *P. Sartorianum* is *P. Molinae* Amshoff, of Honduras. The leaves of this are said to be more obtuse than those of *P. Sartorianum*, and the calyx in bud is shortly 4-lobed rather than calyptrate. In general appearance the plants are like those of *P. Sartorianum*.

Much taxonomic importance has been attached in the past to the manner of opening of the calyx in *Psidium*. It is now known that the calyx may open irregularly in some species with normally calyptrate calyx, and the importance of this particular feature is not fully understood. For notes on the taxonomy of *P. Sartorianum* and its relatives see Fieldiana, Bot. 29: 525–529. 1963.

UGNI Turcz.

Reference: Berg, Linnaea 27: 384–393. 1856.

Shrubs with numerous small coriaceous leaves mostly 2 cm. long or less. Calyx-lobes distinct, 5, rarely 4. Flowers solitary, with persistent foliaceous bracteoles. Stamens numerous (25 or more), the filaments somewhat flattened and dilated, the outer longer and broader, the anthers sagittate, introrse, basifixed and sometimes winged by the margins of the dilated connective. Ovary 3- or 4-locular (according to Berg), the numerous ovules horizontal, affixed to the central bilamellate placentae. Seeds reniform or hippocrepiform, with bony testa, the embryo arcuate.

A genus of about 10 species or fewer, in montane forests from southern Mexico to Chile. It is distinguished technically from *Myrtus* by the characteristic stamens, and from *Myrteola* by the stamens, by the somewhat larger leaves and by the usually 5-merous flowers.

Mexican and Central American plants of this genus seem only doubtfully distinct from *Ugni myricoides* (HBK.) Berg, a species of the higher Andes of northern South America. The South American plant differs mostly in having white fruit and somewhat smaller flowers. Berg distinguished four Central American species chiefly on the basis of anther-shape and by the number of glands at the tip of the anther. Neither of these characters seems to be consistent. The glands sometimes vary from 1 to 3 in a single flower.

Probably all Mexican and Central American plants belong to the following species. Costa Rican specimens, as noted by Berg in describing *U. Oerstedii*, often (but not always) have somewhat broader leaves, and deltoid calyx-lobes 2–3 mm. long and wide. The type of *Myrtus montana* presumably came from a plant with relatively small bracts and leaves, but the specimen is not otherwise very different from most Central American material. The type of *M. Matudai* Lundell has bracteoles 4–7 mm. long and calyx-lobes 3–4 mm. long, longer than those of the type of *M. montana*, as noted by Lundell, but not unusually long when compared with most other specimens.

Ugni montana (Benth.) Berg, Linnaea 27: 392. 1856. *Myrtus montana* Benth. Pl. Hartw. 61. 1840 (type from Monte Pelado, Oaxaca, Hartweg 459). *Ugni Friedrichsthalii* Berg, l.c. 388 (type from Guatemala, Friedrichsthal, the exact locality not specified). *U. Friedrichsthalii* α *longipes* Berg, l.c. 389. *U. Friedrichsthalii* β *brevipes* Berg, l.c. *U. Oerstedii* Berg, l.c. (type from Costa Rica, Oersted). *U. Warscewiczii* Berg, l.c. 390 (type locality, "in Veraguas," Warscewicz). *Myrtus Oerstedii* (Berg) Hemsl. Biol. Centr.

Am. Bot. 1: 407. 1880. *Eugenia Friedrichsthali* (Berg) Hemsl. l.c. 410. *E. Warscewiczii* (Berg) Hemsl. l.c. 411. *Myrtus Friedrichsthali* (Berg) Donn. Sm. Enum. Pl. Guat. 3: 25. 1893. *M. Matudai* Lundell, Phytologia 1: 246. 1937 (type from Chiapas). *Sco* (Volcán de Zunil); *mirto*.

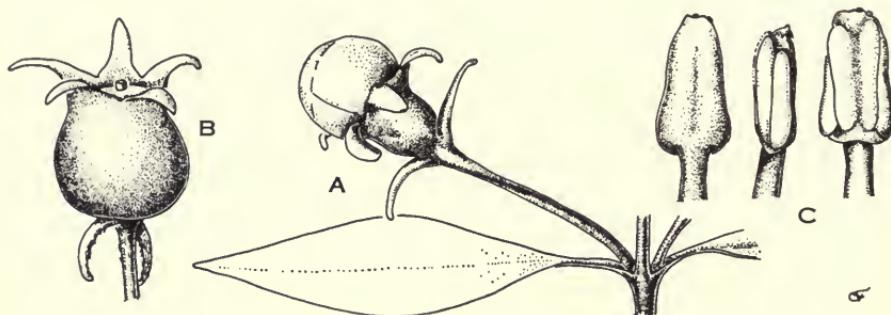


FIG. 55. *Ugni montana* (from Carlson 2390). A, Bud just before opening; $\times 2.5$. B, Slightly immature fruit; $\times 2.5$. C, Dorsal, lateral, and ventral views of anther; $\times 12.5$.

Open, moist or dry, high mountain hillsides and meadows, or often in dense *Cupressus* or *Abies* forest, 1500–3700 meters, most abundant at higher elevations; El Progreso; Zacapa; Chimaltenango; Sololá; Quiché; Huehuetenango; Totonicapán; Quezaltenango; San Marcos. Mountains of southern Mexico (Oaxaca, Chiapas); El Salvador; Honduras; Costa Rica; Panama; perhaps the same species in the Andes from Colombia and Venezuela to southern Ecuador.

A shrub or small tree 1–3 meters high, or often much lower, usually very densely branched, the branches densely leafy; branchlets, inflorescence and young foliage strigose-canescens with sordid hairs, the foliage and flowers soon glabrate; leaves elliptic or occasionally ovate, rigidly coriaceous, mostly 5–10 (–15) mm. wide, (7–) 10–18 (–28) mm. long, about twice as long as wide, acute at both ends or in ovate leaves more rounded at base, the margins decurrent on the petiole 2 mm. long; midvein sulcate above, broad and prominent beneath, the other veins scarcely apparent; blades dark green above, with revolute margins, sometimes impressed-punctate; lower surface paler and dull, with a few small glandular dots; flowers spreading or in age recurved, the pedicels 1–2 cm. long, 0.5 mm. thick; bracteoles in texture like the leaves, linear or elliptic, spreading or at last recurved, up to 1 mm. wide, 3–6 (–8) mm. long; hypanthium sessile in the bracteoles, cup-shaped or hemispheric, 2–3 mm. high; calyx-lobes 5, foliaceous, acutely triangular, loosely recurved or in fruit stellately spreading, 2–4 mm. long, 1.5–2 mm. wide at base; disk glabrous, in fruit up to 3–3.5 mm. wide; style glabrous, 6–7 mm. long, capitate; stamens about 50, probably pale pink to white, the outer ones up to 4 mm. long; anthers 1–1.3 mm. long, sagittate, 0.5–0.6 mm. wide at base, with 1 (occasionally 2–3) apical glands; petals white, 5–7 mm. long; ovary imperfectly

3-locular, the ovules about 10 in each locule, uniseriate on erect bilamellate axile placentae; fruit globose, 6–8 mm. in diameter, at first red, turning black or purplish black; seeds up to 20, broadly reniform, 1.5–2 mm. long, straw color, lustrous.

A very common and characteristic shrub at high elevations, especially in deep forest of *Abies* and *Cupressus* (Standley, mss.).

SPECIES OF UNCERTAIN GENERIC POSITION

Myrtus bullata Salisb. Prodr. 354. 1796. *Calyptanthes?* *bullata* (Salisb.) DC. Prodr. 3: 258. 1828.

The description of this species, and the specific epithet, both suggest *Psidium Sartorianum*. The type was from Honduras.

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